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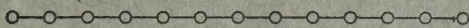
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Government
Publications

107923

ROYAL COMMISSION: QUEBEC BRIDGE INQUIRY.

LIST OF PLANS ACCOMPANYING THE REPORT.



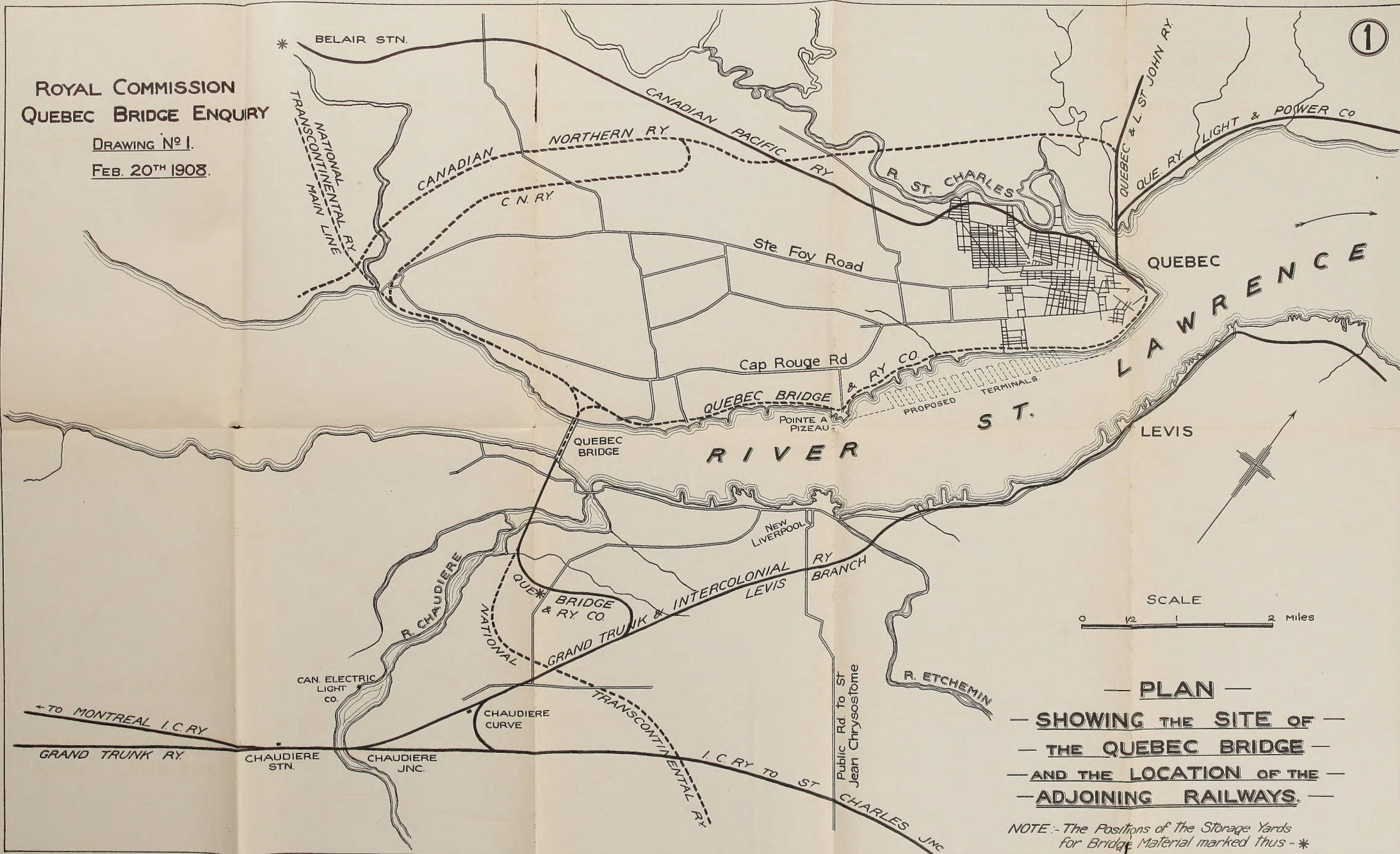
DRAWING
No.

- 1—Plan showing the site of the Quebec Bridge and the Location of the adjoining Railways.
- 2—Diagram showing the principal Dimensions of the Trusses.
- 3—Actual Dead Load Concentrations on completed Bridge.
- 4—Diagram showing Comparison in completed Bridge, of Stresses per sq. in. for following condition :—Dead Load + $1\frac{1}{2}$ Live Load + $\frac{1}{2}$ Wind.
- 5—Diagram showing Marking of Members for Identification during Construction.
- 6—Diagram showing Dates of Erection of Main Truss Members.
- 7—Diagram showing approximate Dates of Riveting Main Splices and Connections.
- 8—Displacement Diagram & Drawing Illustrating Williot's Method.
- 9—Diagram showing Erection Stress in Members.
- 10—Plan showing Position of Witnesses.
- 11—Drawings Copied from the "Blueprint Book of Instructions," issued by the Phoenix Bridge Co.
- 12—Record of Field Reports of the Position of Various Panel Points at different stages of Erection.
- 13—Diagram showing Actual Concentrated Loading on Aug. 29th, 1907.
- 14—Drawings showing Check Measurements made after the Accident to determine whether any Movement of the Main Pier had taken place.
- 15—Plan showing approximate positions of Camera when taking Views 1-24.
- 16—Diagram showing in Plan & Elevation the relative Positions of Panel Points before and after Accident—E. Truss.
- 17—Diagram showing in Plan & Elevation the relative positions of Panel Points before and after Accident—West Truss.
- 18—Plans showing the Positions of the Floorbeams & Stringers before and after the Accident.
- 19—Drawing showing Condition of Chords 9R & 9L Anchor Arm after the Accident.
- 20—Diagram of Column Tests.
- 21—Report of Test made on Model Chord No. 1, by the Phoenix Bridge Co. on Nov. 21st, 1907.
- 22—Shop-Drawing Test-Chord No. 1.
- 23—Shop-Drawing Test-Chord No. 2, showing also Details of Measuring Devices.
- 24—Report of Test made on Model Chord No. 2, by the Phoenix Bridge Co. on Jan. 18th, 1908.
- 25—Drawing showing Details of Special Tests upon Lattice-Bars & Rivets.
- 26—Test made to observe Action of Rivets & Lattice Angles.
- 27—Results of Tests of $3" \times 4" \times \frac{3}{8}"$ Ls. made for the Commission at Wm. Sellers & Co., Phila.
- 28—Diagram showing Deflections in Ribs of Anchor Arm, Lower Chord 9L.
- 29—Diagram showing Deflections in Ribs of Cantilever Arm, Lower Chord 9R.
(Diagram showing Deflections in Ribs of Cantilever Arm, Lower Chord 8R.)
- 30—Also, Plan showing Deflections at the Field-Splice betw. Chords 7L & 8L.
(Cantilever Arm, as measured Aug. 6th, & Aug. 16th, 1907.)
- 31—Elevations of Great Cantilever Bridges—Thebes, Memphis, Monongahela.
- 32—Elevations of Great Cantilever Bridges—Quebec, Blackwell's Is., Forth.
- 33—Preliminary Designs for the Quebec Bridge.
- 34—Drawing showing design of Compression Chords for Bridges mentioned—Thebes, Monongahela.
- 35—Drawing showing design of Compression Chords for Bridges mentioned—Blackwell's Is., Memphis.
- 36—Drawing showing design of Compression Chords for Bridges mentioned—Forth, Quebec.
- 37—Chart showing Wind & Temperature Records.

ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY

DRAWING N^o 1.

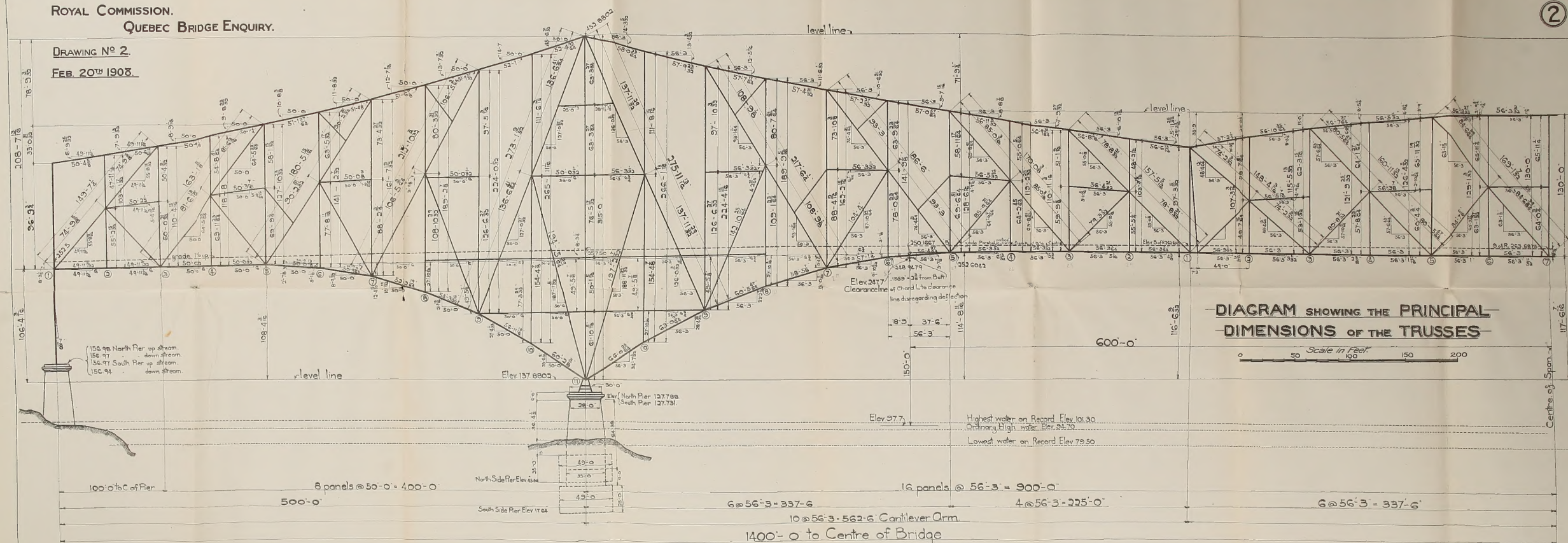
FEB. 20TH 1908.



— PLAN —

- SHOWING THE SITE OF —
- THE QUEBEC BRIDGE —
- AND THE LOCATION OF THE —
- ADJOINING RAILWAYS. —

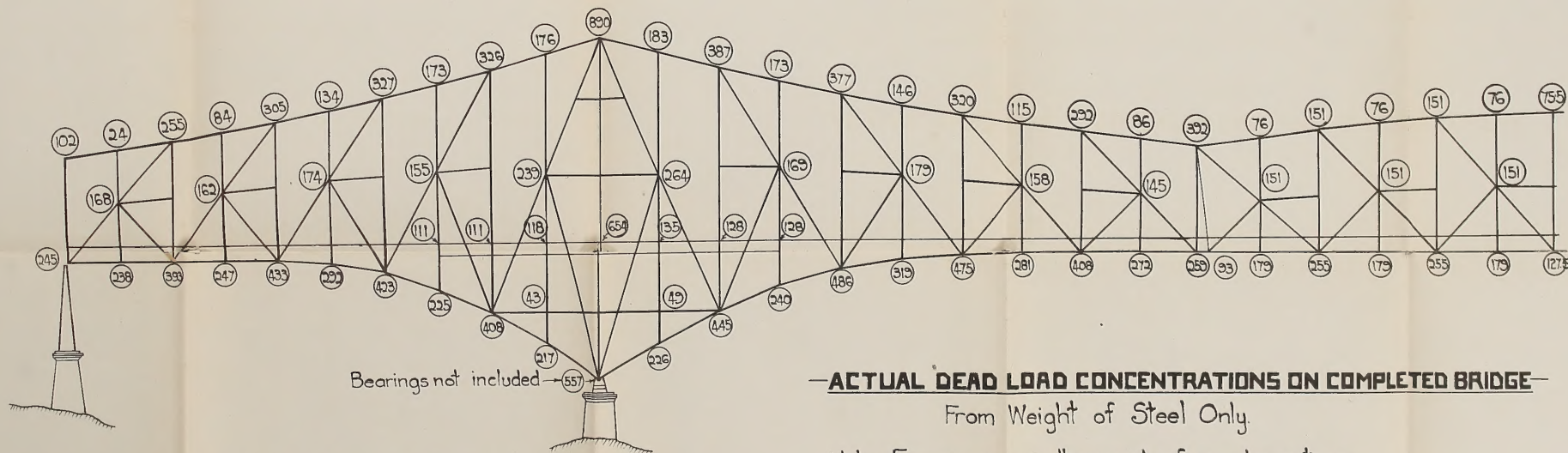
NOTE:— The Positions of the Storage Yards
for Bridge Material marked thus - *

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ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY.

DRAWING No 3

FEB. 20TH 1908.



— ACTUAL DEAD LOAD CONCENTRATIONS ON COMPLETED BRIDGE —
From Weight of Steel Only.

Note:- Dead Load Assumed in original calculations as follows:-

Anchor Arms

Steel Work - 10.790 lbs.pr.lin.ft. pr.truss.

Timber Floor - 1.250

Cantilever Arms.

Steel Work - 11.105

Timber Floor - 1.250

Suspended Span-

Steel Work - 5750

do - 5925

do - 6000

Timber Floor - 1250

The assumed concentrations
do amount to these figures
per foot but panel concentrations
were used in figuring stresses
and not uniform load.

do used for figuring Anchor Arms.

do used for figuring Cant.Arms.

do used for figuring Susp.Span.

do

Note:- Figures given in thousands of pounds per truss.

R.R.track, Timber Floor Etc. 1250 lbs.pr.lin.ft. pr.truss extra.

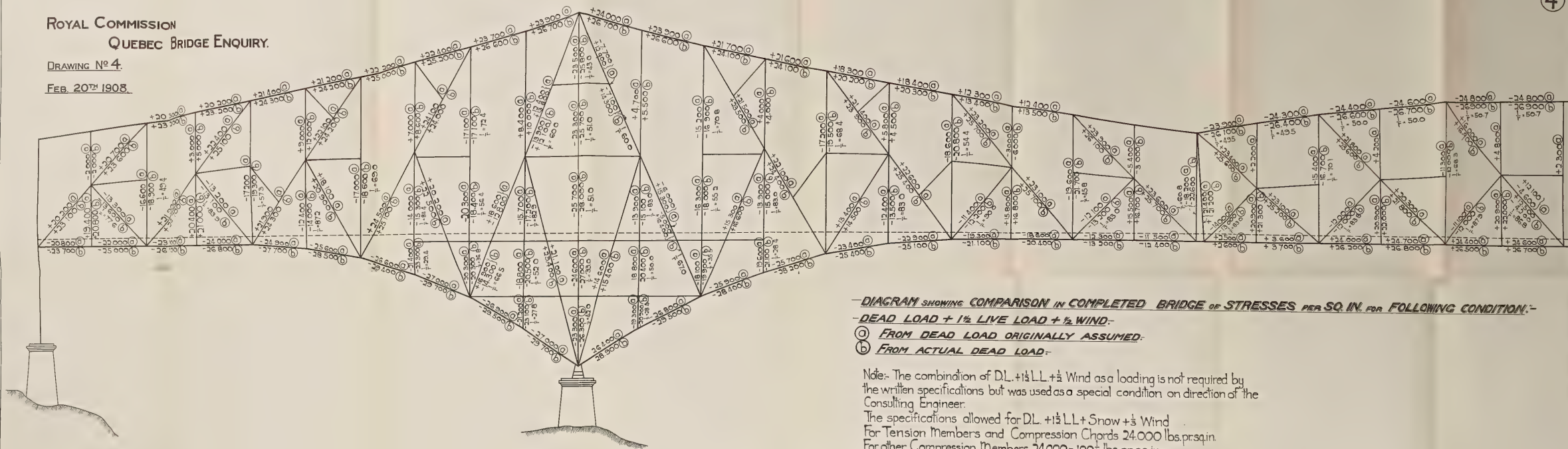
Concentrations determined by the Quebec Bridge Company
and checked by the Phoenix Bridge Company.

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING N^o 4.

FEB. 20th 1908.

4



—DIAGRAM SHOWING COMPARISON IN COMPLETED BRIDGE OF STRESSES PER SQ. IN. FOR FOLLOWING CONDITION:—

—DEAD LOAD + 1½ LIVE LOAD + ½ WIND—

Ⓐ FROM DEAD LOAD ORIGINALLY ASSUMED.

Ⓑ FROM ACTUAL DEAD LOAD—

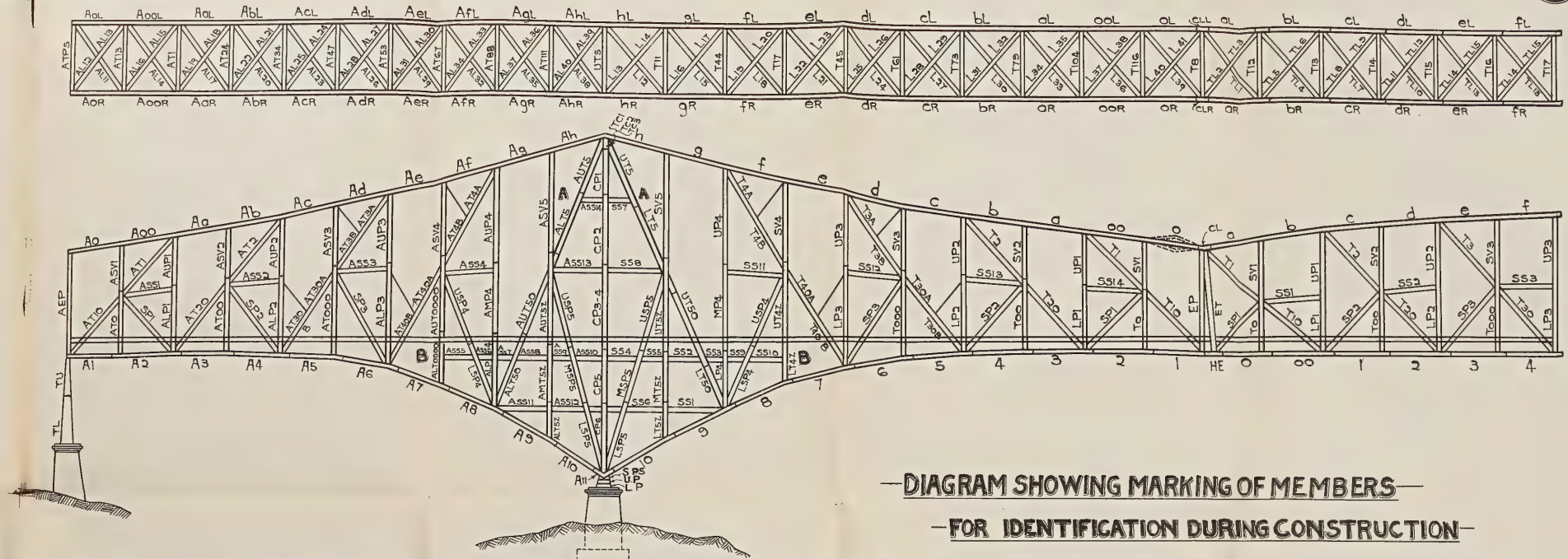
Note:— The combination of DL. + 1½ LL. + ½ Wind as a loading is not required by the written specifications but was used as a special condition on direction of the Consulting Engineer.
The specifications allowed for DL. + 1½ LL. + Snow + ½ Wind
For Tension Members and Compression Chords 24,000 lbs. pr. sq. in.
For other Compression Members 24,000 - 100 lbs. pr. sq. in.
For all Tension Members stress on net section is given
Figures taken from Phoenix Bridge Co. Calculations except Ⓑ
for Suspended Span which is taken from those of C.C. Schneider Con. Engineer

ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY.

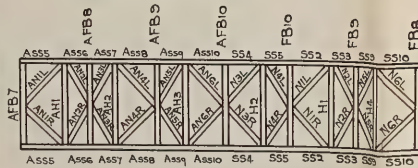
DRAWING N^o 5

FEB. 20TH 1908.

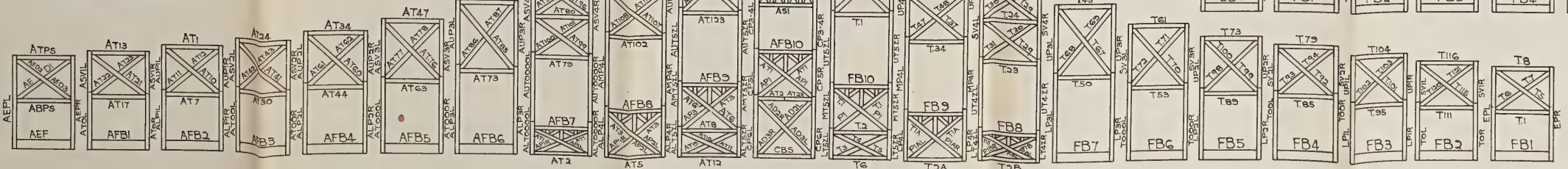
5



SECTION AA-



SECTION BB-

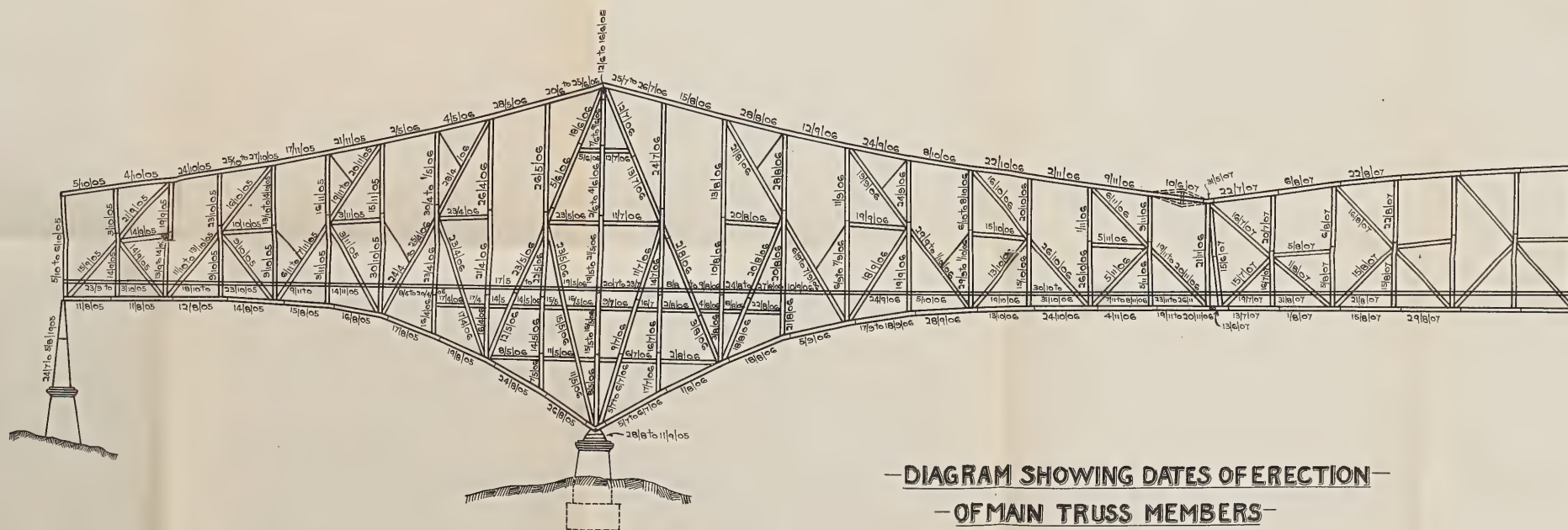


ROYAL COMMISSION.
QUEBEC BRIDGE ENQUIRY.

DRAWING N^o 6.

FEB. 20TH 1908.

6

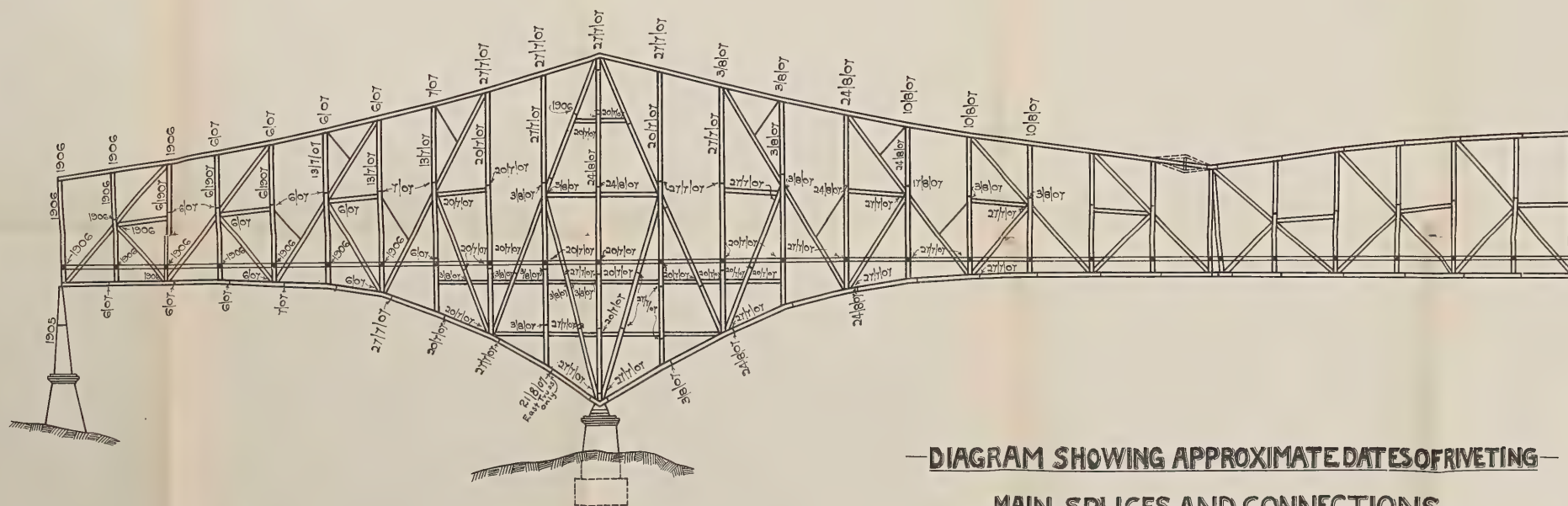


Note:- Dates are indicated as follows Day/Month/Year

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

DRAWING N^o 7.

FEB. 20TH 1908.

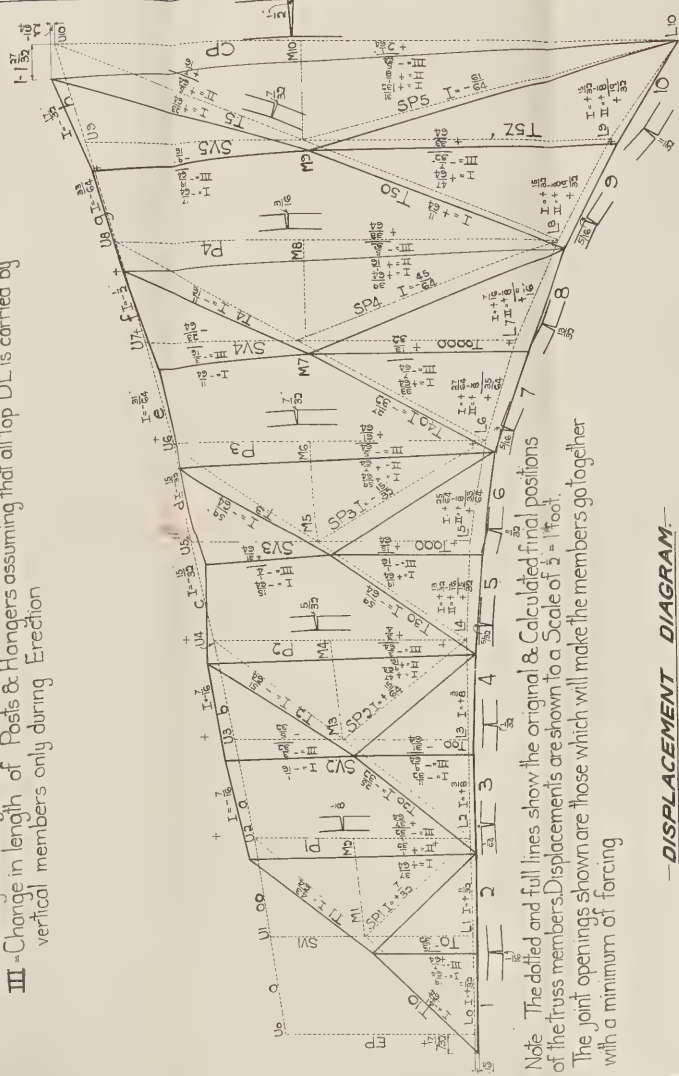


— DIAGRAM SHOWING APPROXIMATE DATES OF RIVETING —

— MAIN SPLICES AND CONNECTIONS —

Note:- Dates Marked as follows Day/Month/Year.
Panel points not marked were not rivetted up at the
time of the accident.

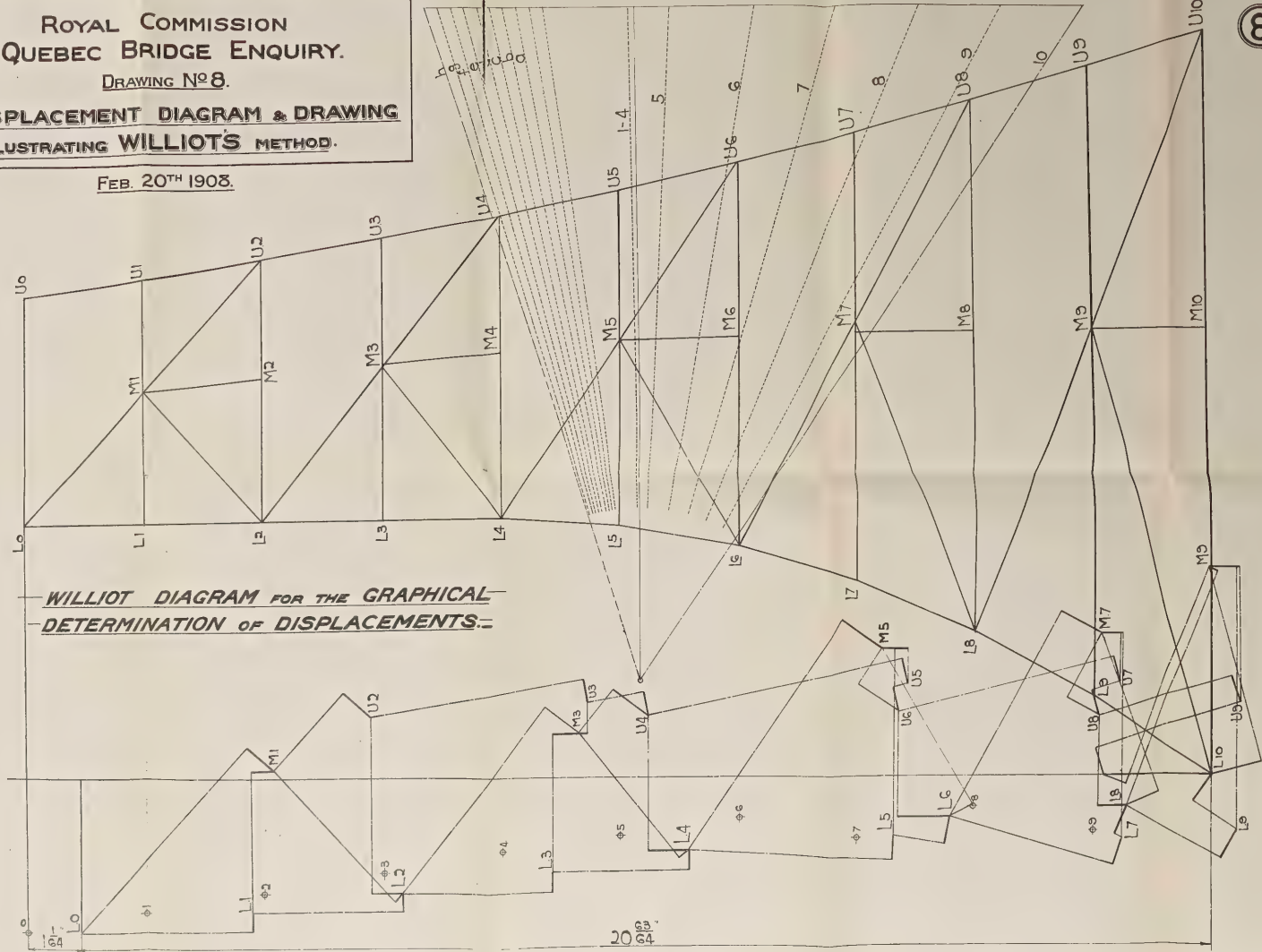
Note:- I = Camber due to LL on Cant. & Susp. Spans + Total DL and assuming position of pins in pin holes to be such as will give easiest method of Erection
 II = Change in length of Posts & Lower Chords due to openings at splices during Erection
 III = Change in length of Posts & Hangers assuming that all top DL is carried by vertical members only during Erection



Note The dotted and full lines show the original & Calculated final positions of the truss members. Displacements are shown to a Scale of $\frac{1}{2} = 1$ foot.
 The joint openings shown are those which will make the members go together with a minimum of forcing

—DISPLACEMENT DIAGRAM—

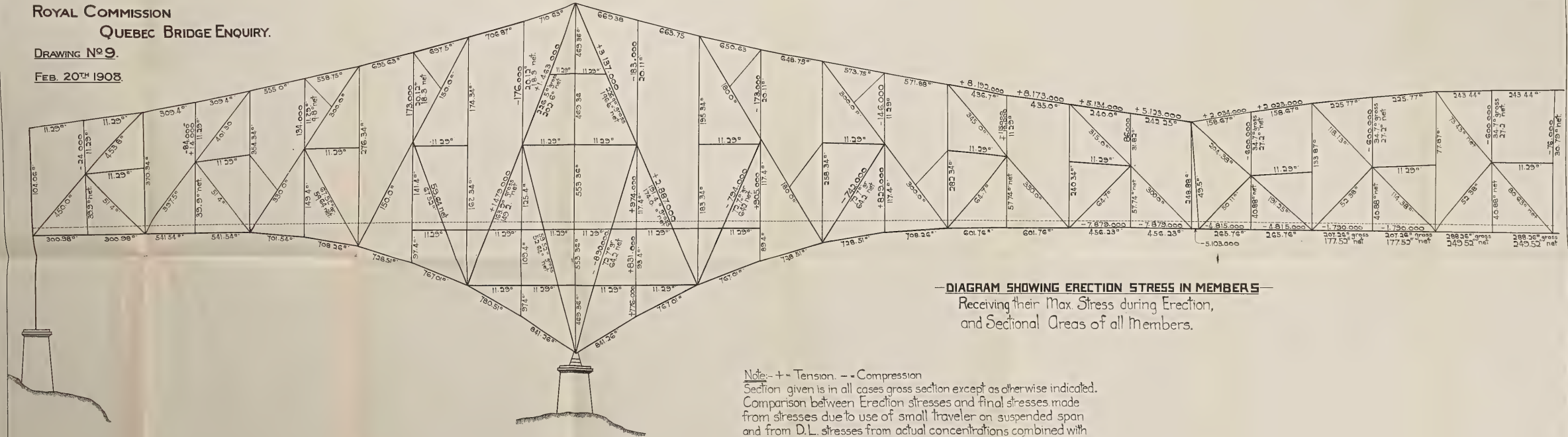
ROYAL COMMISSION
 QUEBEC BRIDGE ENQUIRY.
 DRAWING No 8.
 DISPLACEMENT DIAGRAM & DRAWING
 ILLUSTRATING WILLIOT'S METHOD.
 FEB. 20TH 1908.



ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING No 9.

FEB. 20TH 1908.



— DIAGRAM SHOWING ERECTION STRESS IN MEMBERS —

Receiving their Max. Stress during Erection,
and Sectional Areas of all Members.

Note: + = Tension. - = Compression

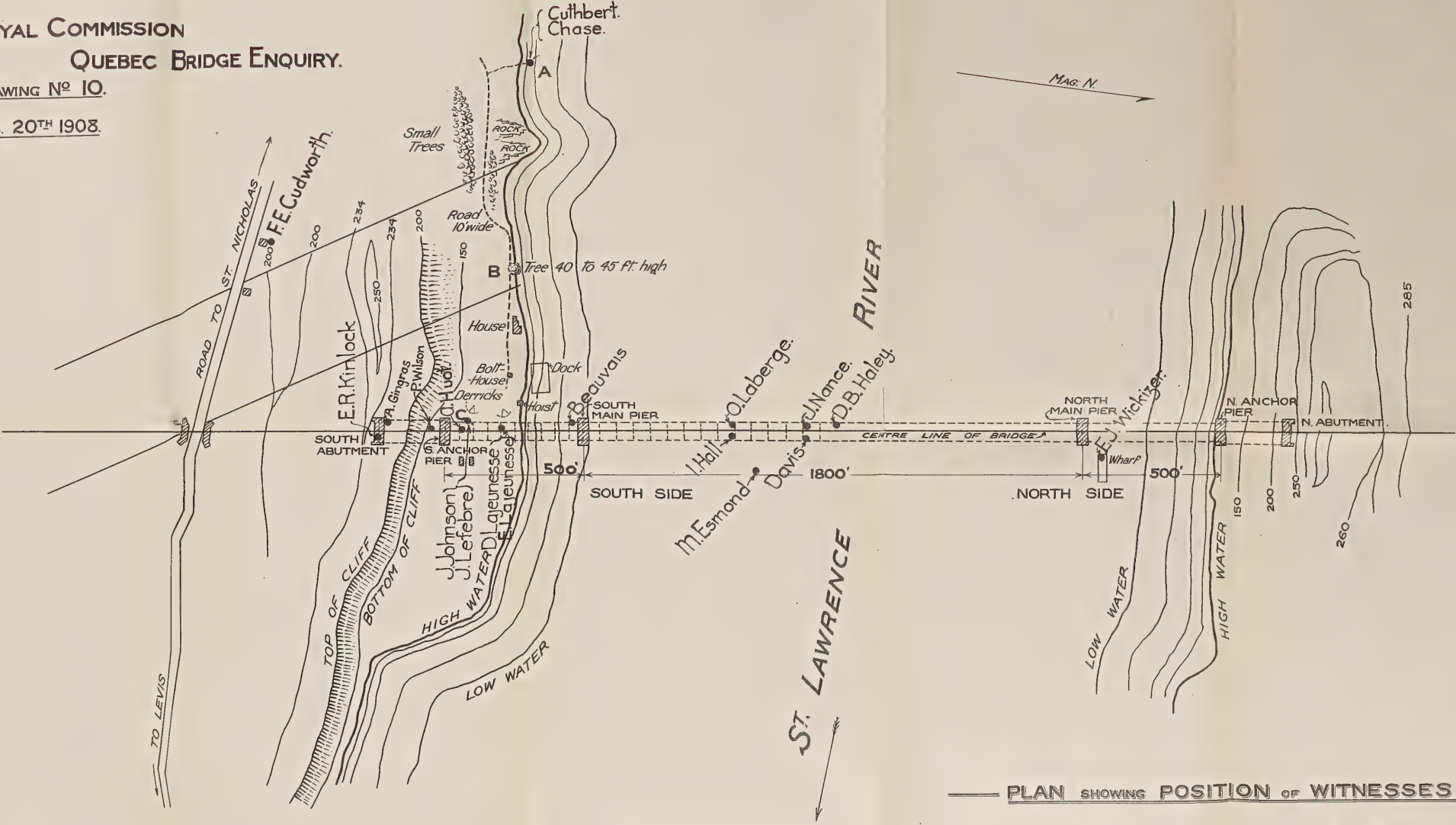
Section given is in all cases gross section except as otherwise indicated.
Comparison between Erection stresses and final stresses made
from stresses due to use of small traveler on suspended span
and from D.L. stresses from actual concentrations combined with
L.L. wind and snow as required by specifications.

(Figures from Calculations of Phoenix Bridge Co.)

ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY.

DRAWING N^o 10.

FEB. 20TH 1908.



PLAN SHOWING POSITION OF WITNESSES.

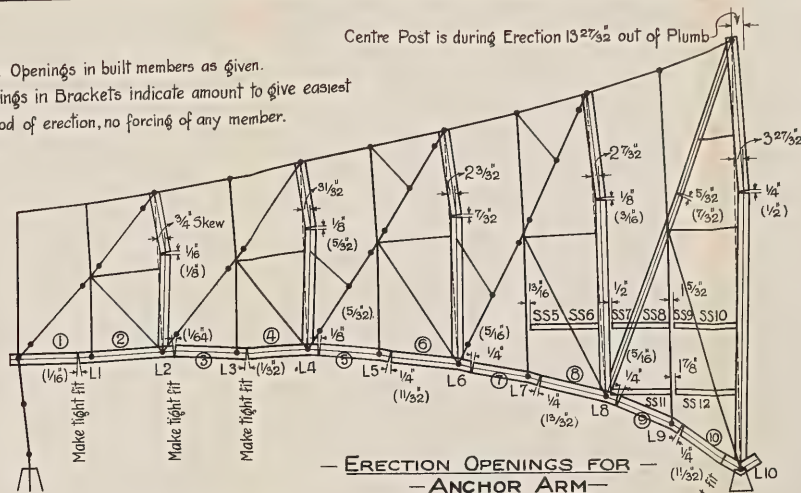
Note: { Datum for Contours is assumed
 { The elevation of the highest water level on record is 101.30.

Centre Post is during Erection $13\frac{27}{32}$ out of Plumb



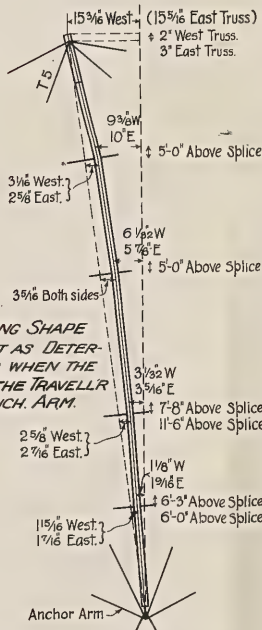
Make Openings in built members as given.

Openings in Brackets indicate amount to give easiest method of erection, no forcing of any member.



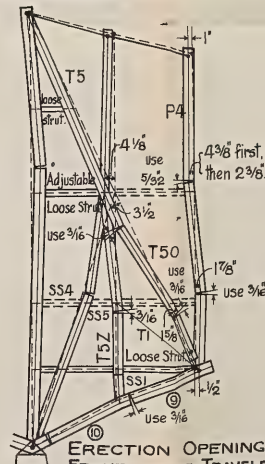
— ERECTION OPENINGS FOR —
— ANCHOR ARM —

— DRAWINGS COPIED FROM THE BLUEPRINT —
— BOOK OF INSTRUCTIONS ISSUED BY THE —
— PHOENIX BRIDGE CO. —



SKETCH SHOWING SHAPE
OF CENTRE POST AS DETER-
MINED IN FIELD WHEN THE
FRONT LEG OF THE TRAVELLER
WAS AT T5Z. ANCH. ARM.

— CENTRE POST —



ERECTION OPENINGS
FRONT LEG OF TRAVELER
STANDING AT T5Z.

— CANTILEVER ARM —

ROYAL COMMISSION

DRAWING No II.

FEB. 20TH 1908.

QUEBEC BRIDGE ENQUIRY

Note: The positions of the pins (A) LEP and of the various points on the main or centre posts have been determined by measuring in inches the deviations from the vertical.

1906.												1907.																				
DATE	JAN. 29		JUNE 4		JULY 2		AUG. 2		SEP. 24		SEP. 25		OCT. 31		NOV. 5		NOV. 20		NOV. 27		DEC. 17		JAN. 17		FEB. 17		MAY 20		JULY 7		AUG. 24	
TEMP.	-2		+75		+102		+112		+60		+42		+40		+30		+28		+26		+20		+17		+10		+8		+7		+6	
DIST.	2 1/2		7 1/2		8 1/2		8 1/2		4 1/2		3 1/2		1 1/2		1 1/2		0 1/2		0 1/2		0 1/2		0 1/2		0 1/2		0 1/2		0 1/2		1 - 2	
CORRECTION	+1 1/2		-1 1/2		-2 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2		-1 1/2	
DIST. AT 35	+4 1/2		+5 1/2		+6 1/2		+6 1/2		+5 1/2		+3 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2		+1 1/2	

POSITION OF PIN (A) LEP Minus sign indicates forward inclination.



1906										1907							
JUNE 22	JULY 13	AUG. 3	AUG. 18	SEPT. 1	SEPT. 17	SEPT. 20	OCT. 9	OCT. 12	OCT. 24	NOV. 4	NOV. 9	NOV. 19	NOV. 26	MAY 23	JUNE 24	AUG. 6	AUG. 22
15 1/4	14 1/4	13 1/4	11 1/4	11 1/8	10	9 1/8	8 3/8	8 1/8	7 7/8	6 5/8	6 1/2	5 3/4	4 3/4	4 3/8	2 1/8	1 3/8	1 1/4
9 1/8	9	11	8 1/2	7 1/2	6 1/2	6 1/8	6 1/8	6 1/8	5 1/2	4 3/4	4 1/2	3 3/4	3 3/8	3 1/8	1 1/8	1 1/8	1 1/8
6	6 1/8	7 1/8	5 1/2	5 1/8	5 1/8	4 7/8	4 3/4	4 3/4	4	3 1/2	3 1/2	3	3 1/8	3 1/8	1 1/8	1 1/8	1 1/8
3	3	2 1/2	2	2 1/8	2 1/8	2	2	2	2 1/8	1 3/8	1 1/2	1 1/4	1 1/8	1 1/8	0 1/2	0 1/2	0 1/2
1 1/8	1 1/4	2 1/8	1	1 1/8	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4	0 3/4

— INCLINATION OF MAIN POST —

FINAL GRADES

POINT	GRADE
SSP3	255.44
SSTo	255.41
SSP2	255.33
SSTo	255.19
SSP1	254.99
SSTo	254.74
EP	254.43
To	254.06
P1	253.64
To	253.16
P2	252.63
To	248.97
P3	239.13
T4Z	223.11
P4	200.89
T5Z	172.49
CP	137.90
AT5Z	171.43
AP4	198.76
AT0000	219.91
AP3	234.88
AT000	243.66
AP2	246.25
AT00	245.75
API	244.25
ATO	244.75
AEP	244.25

(A) LEP
For amount of inclination see Table of Dist.

WEST TRUSS.

ELEVATIONS measured from line shown above and referred to grades as given in the table at the left. Grades from Gen. Drawing + 9/32 per Dw. #144, C.O. 606-7.

	ANCHOR ARM										CANTILEVER ARM										SUSPENDED SPAN			
	ALP	ATO	API	AT00	AP2	AT000	AP3	AT0000	AP4	AT5Z	C.P.	T5Z	P4	T4Z	P3	To	P2	To	P1	To	EP	SSTo	SSP1	SSTo
JUNE 20	3/4	1/2	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
JUNE 26	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
JULY 14	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
AUG. 1	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
AUG. 18	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
SEPT. 1	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
SEPT. 18	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
SEPT. 28	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
OCT. 12	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
OCT. 24	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
NOV. 4	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
NOV. 19	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
NOV. 26	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
MAY 23	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
JULY 11	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
JULY 23	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
AUG. 8	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4
AUG. 23-24	1/2	1/4	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10	1/2	1/4	1/2	3/4	1/2	1/4	1/2	3/4	1/2	1/4	1/2	1/4	1/2	1/4

		1906										1907					
DATE		JAN. 29	JUNE 4	JULY 22	AUG. 2	SEPT. 24	SEPT. 25	OCT. 31	NOV. 5	NOV. 20	NOV. 27	JAN. 17	MAY 20	JULY 24	AUG. 7	AUG. 24	
TEMP.		- 2	+ 75	+102	+112	+60	+42	+40	+30	+28	+26	-40	+48	+68	+70	+68	
DIST.		+2 1/2	+ 8	+8 1/2	+8 1/2	+4 1/2	+3 1/2	+2	+1 1/2	+0 1/2	+0 1/2	+0 1/2	+0 1/2	+0 1/2	+1 1/2	+1 1/2	
CORRECTION		+1 1/2	-1 1/2	-2 1/2	-1 1/2	-1 1/2	-1 1/2	-0 1/2	-0 1/2	-0 1/2	-0 1/2	-0 1/2	-0 1/2	-1 1/2	-1 1/2	-1 1/2	
DIST. AT 35		+4	+6 1/2	+6 1/2	+5 1/2	+3 1/2	+1 1/2	+1 1/2	+1 1/2	+1 1/2	+1 1/2	+1 1/2	+1 1/2	+1 1/2	+2 1/2	+3	

POSITION OF PIN (A) LEP Minus sign indicates forward inclination.



1906												1907			
JUNE 25	JULY 13	AUG. 3	AUG. 18	SEPT. 1	SEPT. 17	SEPT. 28	OCT. 9	OCT. 12	OCT. 24	NOV. 4	NOV. 19	NOV. 26	MAY 23	JULY 8	AUG. 20
15%	14%	13%	12%	12%	13%	9%	9%	8%	5%	7	6%	5%	4%	2%	1%
10	10%	10%	8%	8%	7%	7%	7	7%	6%	5	4%	3%	4%	2%	1%
5%	6%	6%	5%	5%	4%	4%	4%	4%	5	4%	3%	3%	4%	2%	1%
3%	3%	3%	4%	4%	3%	2%	2%	2%	2%	2%	1%	1%	1%	0%	1%
1%	1%	3%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	1%

— INCLINATION OF MAIN POST —

LARGE TRAVELER

moved to	C.P	JUNE 30
" "	T5Z	JULY 31
" "	P4	AUG. 17
" "	T4Z	AUG. 31
" "	P3	SEPT. 17
" "	Tooo	SEPT. 27
" "	P2	OCT. 12
" "	Too	OCT. 24
" "	P1	NOV. 4
" "	To	NOV. 19
at	To	NOV. 26
"	To	MAY 23
"	To	JULY 11
"	To	JULY 23
"	To	AUG. 8
"	To	AUG. 24
"	To	AUG. 28

SMALL TRAVELER

at	EP	JULY 11
Panel "O" Erected	EP	JULY 23
"OO" Nearing	TO	AUG. 8
"I" -	PI	AUG. 24
	Too	AUG. 28

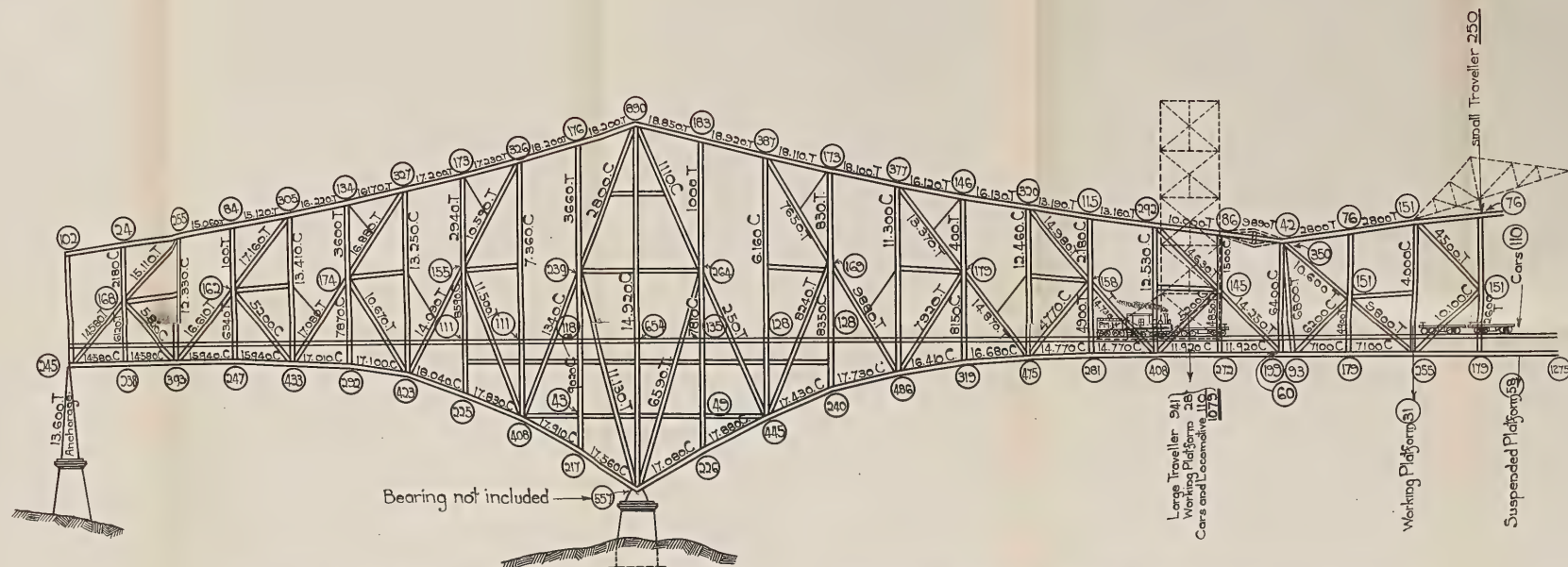
ELEVATIONS measured from line shown above and referred to grades as given in the table at the left. Grades from Gen. Drawing + 9/32 per Dw. #144, C.O. 606-7.

		ANCHOR ARM										CANTILEVER ARM										SUSPENDED SPAN			
		APF	ATO	API	ATOO	AP2	AT000	AP3	AT0000	AP4	AT5Z	C.P	T5Z	P4	T4Z	P3	To	P2	To	P1	To	EP	SSTO	SSP1	SSTO
901	JUNE 20	3/4	1/2	2/3	3/4	4/5	5/6	4/6	5/6	3/1	2/8														
	JUNE 26	1/2	1/4	2/3	3/4	4/5	5/6	4/6	5/6	3/4	2/8														
	JULY 14	1/2	1/4	2/3	3/4	4/6	5/6	4/6	5/6	3/1	2/8														
	AUG.	3/4	2/6	2/3	3/4	4/6	5/6	4/4	5/1	2/4	2/8		3/8h												
	AUG. 16	1/2	1/4	1/3	3/6	3/6	4/6	5/6	4/6	5/1	2/8		3/8h	6 1/2h											
	SEPT. 1	1/4	2/4	1/3	3/6	4/4	5/6	4/4	4/3	3/6	2/4		1h	5/8h	8/8h										
	SEPT. 18	1/2	2/6	2/3	3/4	4/1	5/6	4/4	4/3	3/6	2/4		1h	4/2h	6/8h	11/8h									
	SEPT. 28	3/8	1/6	2/3	3/2	3/2	4/6	4/6	4/1	4/3	3/4		1/8h	3/8h	9/4h	13/8h									
	OCT. 12	3/8	2/1	2/3	4/6	4/6	4/6	4/6	3/8	3/6	2/3		1/8h	2/8h	4/8h	8/1	11/4h	17/2h							
	OCT. 24	3/8	1/2	2/3	3/6	4/4	5/6	4/6	4/6	4/6	2/3		3/8h	2/8h	4/8h	7/2h	10/2h	15/8h	19/4h						
1061	NOV. 4	1/4	1/6	2/3	3/6	4/4	5/6	4/4	4/2	3/4	2/3		1/4	2/4h	4/4	5/2h	8/2h	12/8h	16/4h	21/8h					
	NOV. 19	1/4	1/6	2/3	3/6	3/6	4/2	4/1	4/4	3/6	2/4	1/8	1/8h	3/8h	5/8h	8/8h	11/8h	15/8h	18/8h	21/8h					
	NOV. 26	1/4	1/6	2/1	2/3	3/6	3/6	3/6	3/6	2/3	2/4	1/8	1/8h	3/4h	4/2h	6/8h	10/8h	12/8h	16/2h	19/8h	23/8h				
	MAY 23	1/4	1/6	1/3	2/6	3/1	3/6	4/1	2/3	2/4			1/4	3/4h	4/1	6/8h	9/8h	12/8h	15/8h	18/8h	23/4h				
	JULY 11	3/8h	1/1	2/6	2/6	2/2	2/2	4/1	2/3	2/4			1/2	1/4h	2/4	3/8h	5/8h	7/8h	10/8h	12/8h	14/8h	17/8h			
	JULY 23	1/4	1/2	1/1	5/6	2/6	2/6	2/1	2/2	1/3	1/2		1/2	1/4h	2/4h	4/4	6/4	7/8h	9/8h	13/2h	14/8h	23/8h			
	AUG.	3/8	1/4	1/2	1/6	1/8	2/1	3/4	1/3	1/2			1/2	1/4h	3/8h	1/2	2/8h	3/4h	4/8h	5/8h	6/8h	10/2h	18/8h	25/4h	
	AUG. 23-29	1/4	1/6	1/2	1/6	1/8	2/4	3/4	1/4	3/8			1/2	1/4h	3/8h	1/2	2/8h	3/4h	4/8h	5/8h	6/8h	14/8h	18/8h	25/4h	

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING N^o 13.

FEB. 20TH 1908.



Note: Figures shown above thus \bigcirc are in units of one thousand pounds per truss and include weight of steel work only except as indicated. To these should be added 250 lbs pr. lin. ft. pr. truss throughout entire bridge for weight of track, applied at floor line, giving a panel weight for Anchor Arm of 12.5 thousand pr. truss, and for Cant. Arm and Suspended Span of 14 thousand pr. truss.

In the Unit Stresses C = Compression and T = Tension.

(Figures from Calculations of Phoenix Bridge Co.) and verified by independent Calculations by C.C. Schneider Consulting Engineer

— DIAGRAM SHOWING ACTUAL CONCENTRATED LOADING —

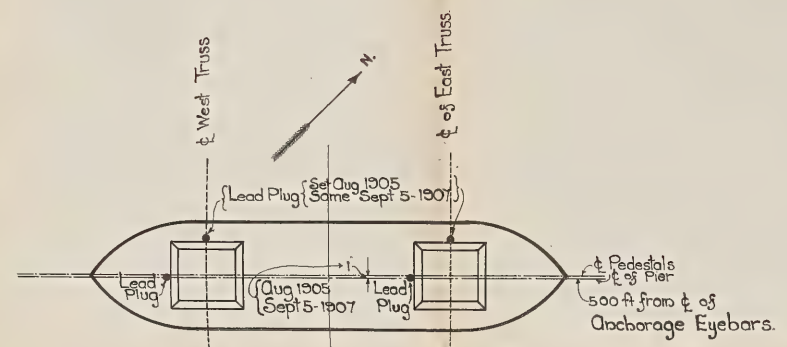
— ON AUG. 29, 1907 —

and Resulting Stress Per Sq in on Members.
(Wind not included)

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

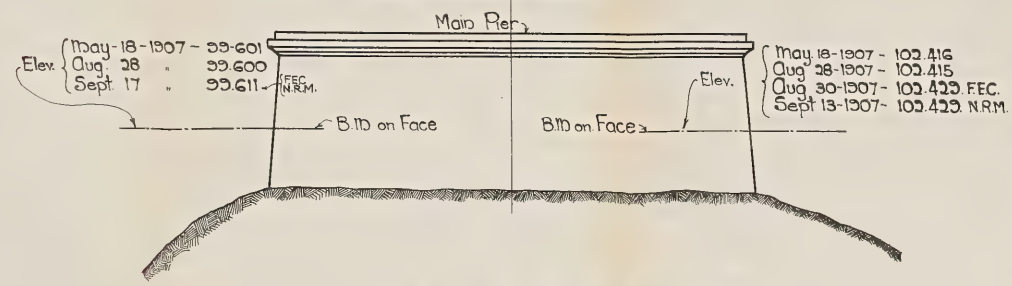
DRAWING N^o 14

FEB. 20TH 1908.



— Sketch Showing Position of Pedestals —

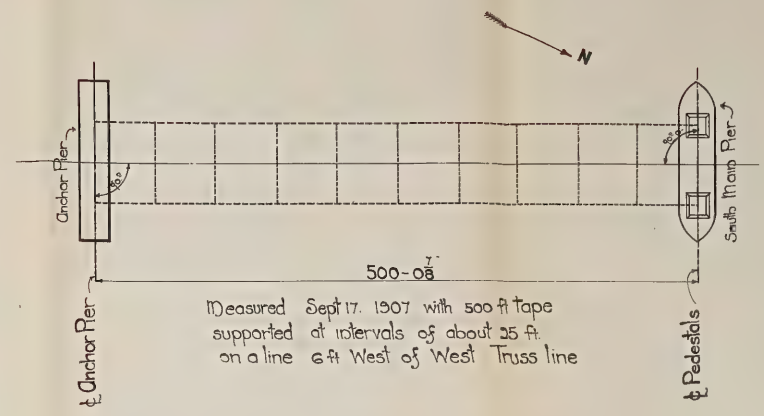
Before and after Collapse.



— Elevation of South Main Pier —

Sept 17-1907.

Dates on which levels were taken are noted
(The accident occurred on Aug. 29th 1907.)



— Measurement Between South Main and Anchor Piers —

September 17-1907

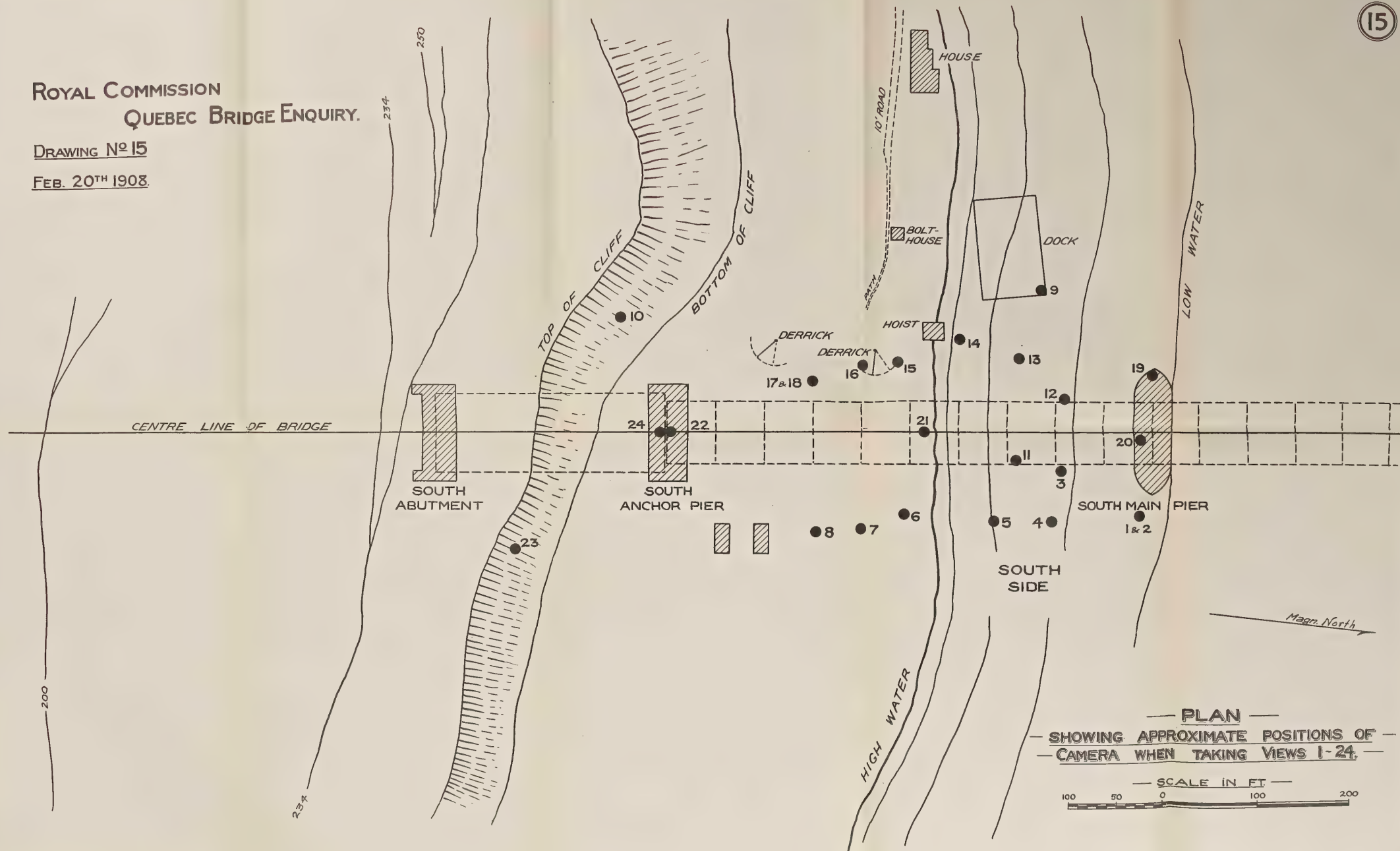
Note:— Pedestals were originally set 1' North of ϵ of Main Pier thus making distance given above 500 ft. in as originally measured.

— DRAWINGS SHOWING CHECK MEASUREMENTS —
— MADE AFTER THE ACCIDENT TO DETERMINE —
— WHETHER ANY MOVEMENT OF THE MAIN PIER —
— HAD TAKEN PLACE. —

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING N° 15

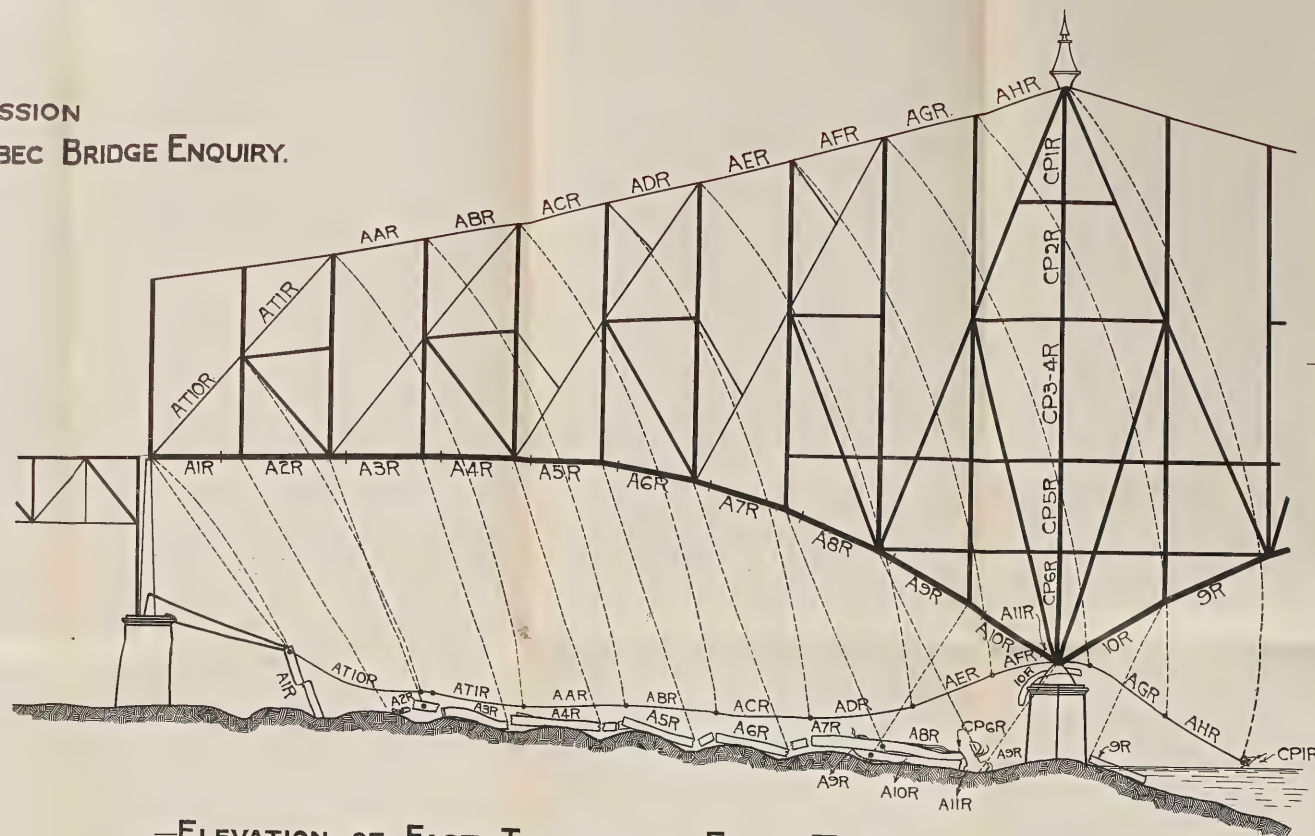
FEB. 20TH 1908.



ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING No 16.

FEB. 20TH 1908.

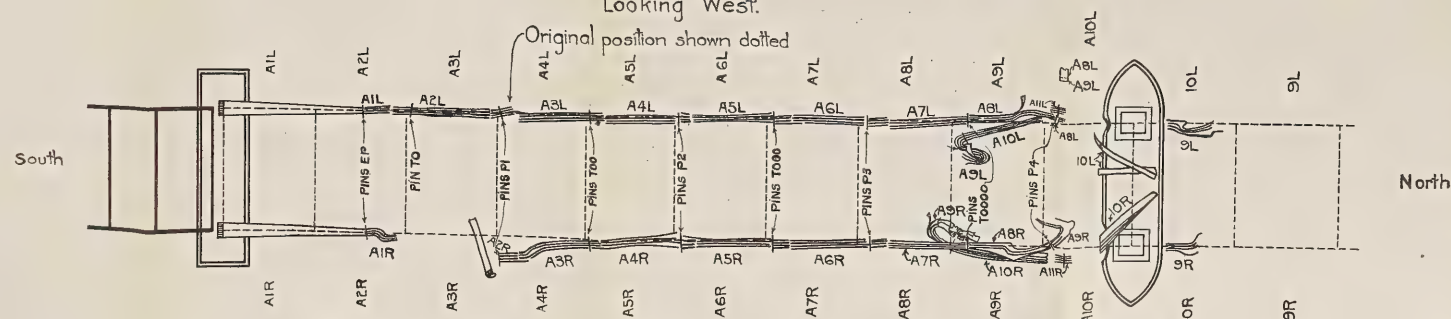


— DIAGRAM —
— SHOWING IN PLAN & ELEVATION —
— THE RELATIVE POSITIONS —
— OF PANEL POINTS —
— BEFORE & AFTER ACCIDENT —
— (EAST TRUSS.) —

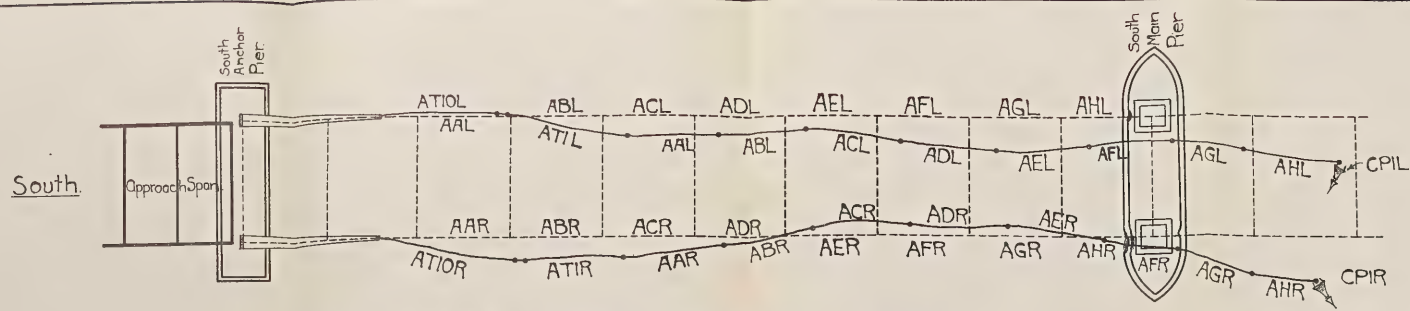
— ELEVATION OF EAST TRUSS AND EAST TRUSS SYSTEM —

Looking West.

Original position shown dotted

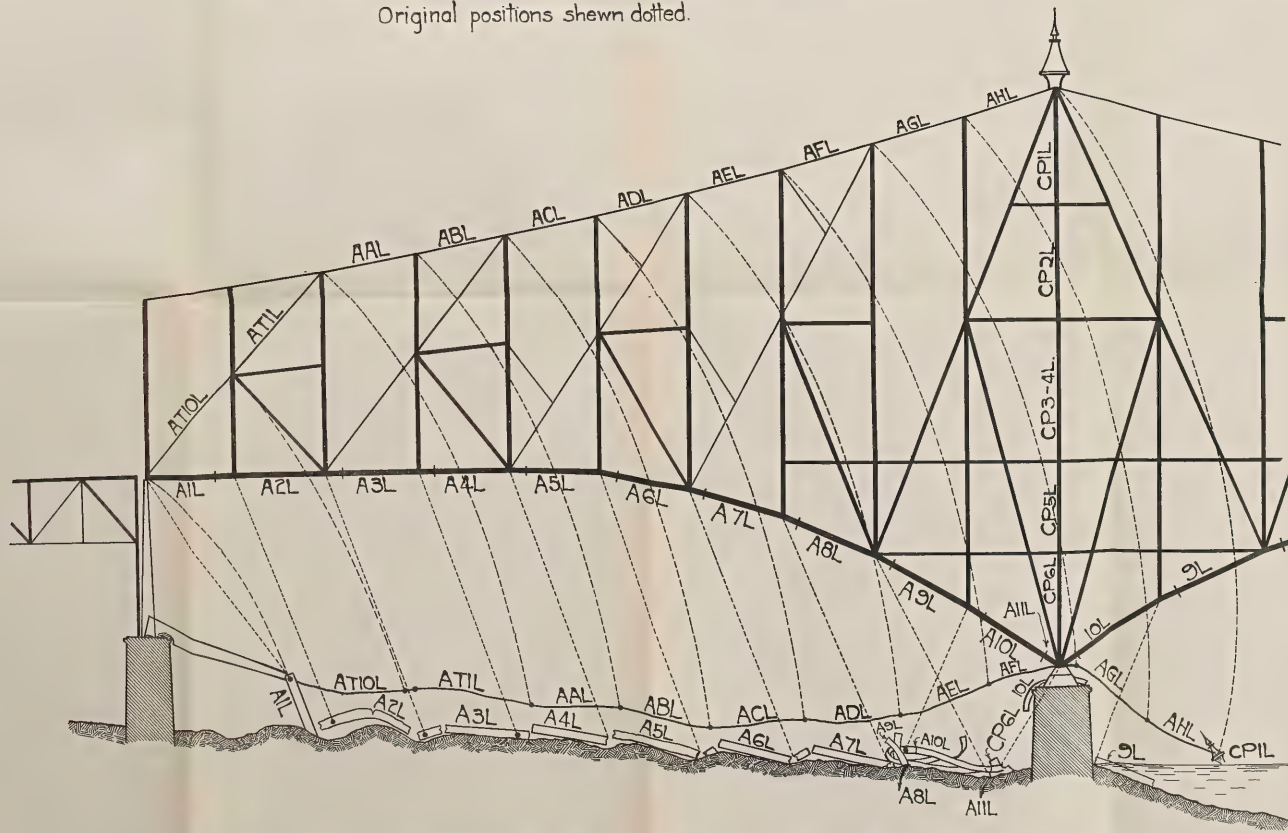


— PLAN OF BOTTOM CHORD SYSTEM IN WRECK —



-PLAN OF TOP CHORD SYSTEM IN WRECK-
Original positions shewn dotted.

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY
DRAWING N^o 17.
FEB. 20TH 1908.



-SECTIONAL ELEVATION OF WEST TRUSS AND WEST CHORD SYSTEM-
Looking West.

-DIAGRAM-
-SHOWING IN PLAN & ELEVATION-
-THE RELATIVE POSITIONS-
-OF PANEL POINTS-
-BEFORE & AFTER ACCIDENT.-
-(WEST TRUSS.)-

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

DRAWING No 18.

FEB. 20TH 1908.

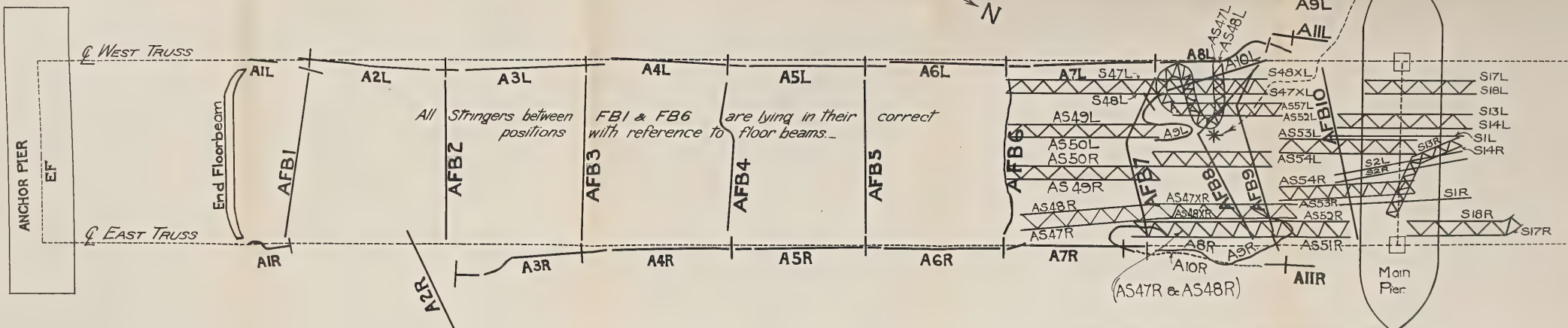
PLANS SHOWING THE POSITIONS
OF THE FLOOR BEAMS & STRINGERS
BEFORE & AFTER THE ACCIDENT.

18

Scale in Feet
0 50 100

	AS30L	AS26L	AS17L	AS13L	AS17L	AS45L	AS47L	AS48XL	AS47L	AS51L		S17L
	AS31L	AS27L	AS18L	AS12L	AS18L	AS46L	AS48L	AS47XL	AS48L	AS52L		S18L
	AS29L	AS23L	AS10L	AS8L	AS10L							S13L
	AS29L	AS23L	AS11L	AS9L	AS11L							S14L
	AS21L	AS19L	AS11L	AS3L	AS11L	AS43L	AS49L	AS50XL	AS49L	AS53L		S1L
	AS22L	AS20L	AS2L	AS4L	AS2L	AS44L	AS50L	AS49XL	AS50L	AS54L		S2L
	AS22R	AS20R	AS2R	AS4R	AS2R	AS44R	AS50R	AS49XR	AS50R	AS54R		S2R
	AS21R	AS19R	AS1R	AS3R	AS1R	AS43R	AS49R	AS50XR	AS49R	AS53R		S1R
	AS29R	AS23R	AS10R	AS8R	AS10R							S14R
	AS29R	AS23R	AS10R	AS8R	AS10R							S13R
	AS31R	AS27R	AS18R	AS12R	AS18R	AS46R	AS48R	AS47XR	AS48R	AS52R		S18R
	AS30R	AS26R	AS17R	AS13R	AS17R	AS45R	AS47R	AS48XR	AS47R	AS51R		S17R
	Panel.1.	Panel.2.	Panel.3.	Panel.4.	Panel.5.	Panel.6.	Panel.7.	Panel.8.	Panel.9.	Panel.10.		Panel.10.

Note: The four sets of stringers AS49XL-AS50XL & AS49XR-AS50XR in Panel 8 and AS49L-AS50L & AS50R-AS49R in Panel 9 are lying piled on top of one another at this Point* the Stringers in Panel 8 having moved Northward about 50 Ft.

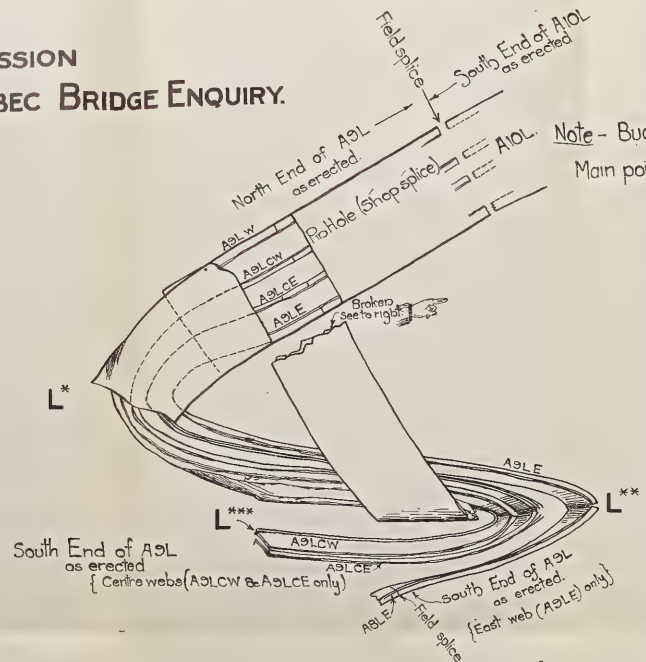


NOTE: The positions of the stringers as shown above are practically correct longitudinally, but no effort has been made to indicate closely their elevations in transverse positions.

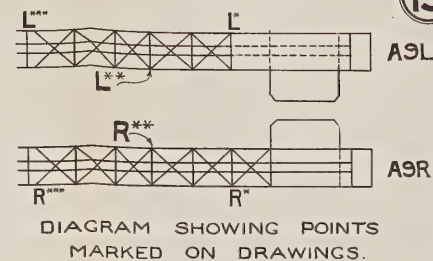
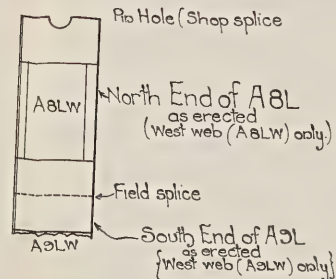
ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY.

DRAWING No 19.

FEB. 20TH 1908.



Note - Buckling
Main points of Buckling marked L*, L**, L***



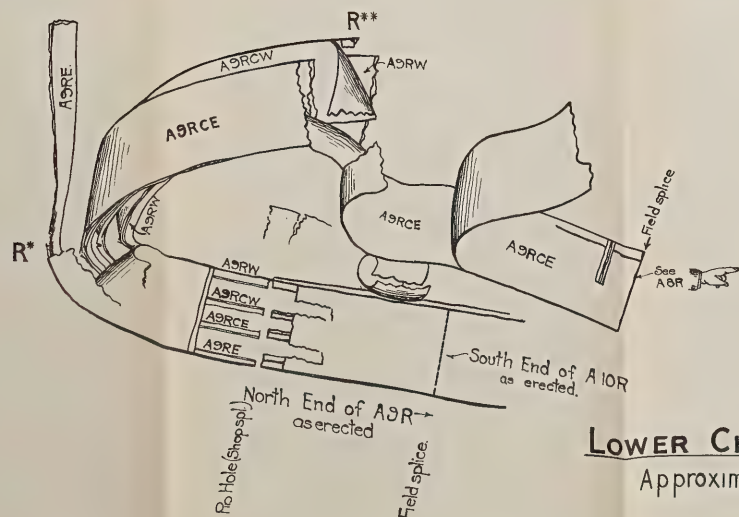
19

Note - Web Marking

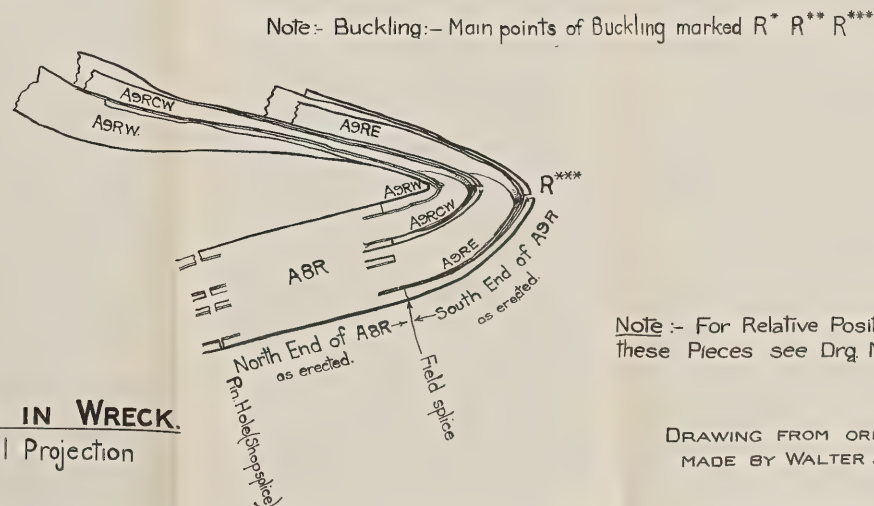
Main Webs at West Side are marked	A9LW
Main Webs at Centre next West	A9LCW
Main Webs at Centre next East	A9LCE
Main Webs at East Side	A9LE

- DRAWING SHOWING CONDITION OF CHORDS 9R & 9L - - ANCHOR ARM AFTER THE ACCIDENT -

LOWER CHORD A9L IN WRECK. Approximate Horizontal Projection.



LOWER CHORD A9R IN WRECK. Approximate Horizontal Projection



Note :- For Relative Positions of these Pieces see Drg No. 16

DRAWING FROM ORIGINAL SKETCH
MADE BY WALTER J. FRANCIS C.E.

ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY

DRAWING N^o 20.

FEB. 20TH 1908.

— DIAGRAMS OF COLUMN TESTS. —

NOTE: The following Records of Tests have been examined and include practically all Records of Tests of large Iron & Steel Columns which have been made on the Continent.

Tests of Metals made at the Watertown Arsenal-----1880-1884.

Tests reported by G. Bouscaren Vol. IX Am. Soc. C.E. 1880

" " Clarke, Reeves & Co. Vol. XI " 1882

" " C. L. Strobel Vol. XVIII " 1888

" " J. G. Dagon Vol. XX " 1889

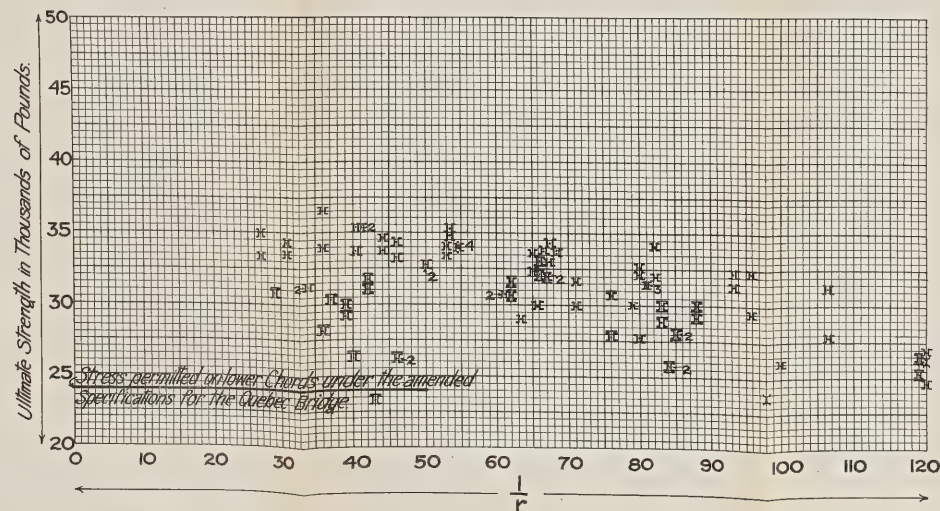
" " in Burris' Materials of Engineering "

" " by C. P. Buchanan Eng News Dec. 1907

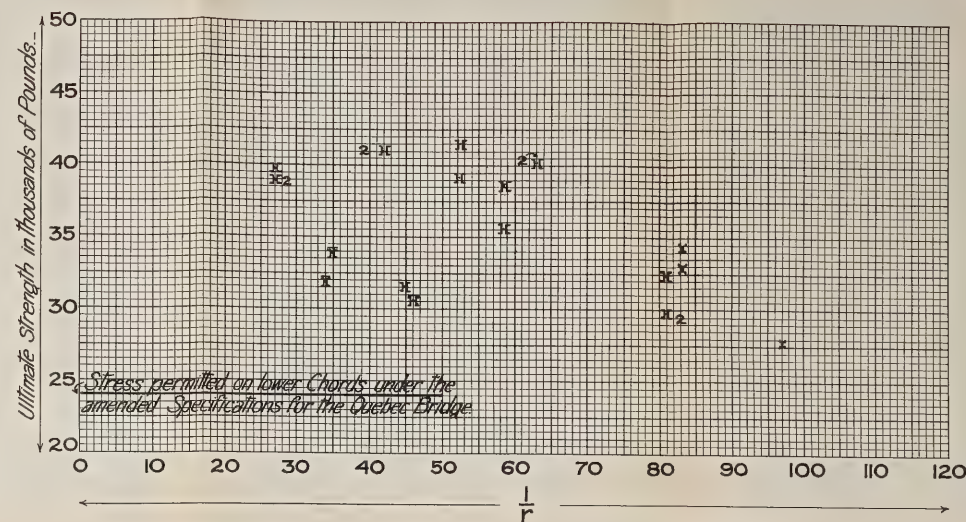
" " J. A. L. Waddell Jan 1908

All the published Results of Tests at Watertown & the Records of the Tests by Christie, Marshall, & others have been examined. Some are not used here for the reasons stated below. No Records of Tests of large-sized Columns by European Engineers have been obtained. In general no Tests on Solid Sections or on Sections of less than 75" A. are shown. The larger Number of the Sections were more than 10" A. No Records of Tests on Sections that were considered to have been badly designed are shown except those of the Buchanan Tests which are included on account of the large Area of the Sections. The Buchanan Columns were nearly all of π Section, & the weakness of this type is clearly shown. The general Form of the Cross Section of each Column is shown in the Plotting. Where the Numeral '2' appears close to a Plotting it indicates that two separate & similar Tests have given the same Result.

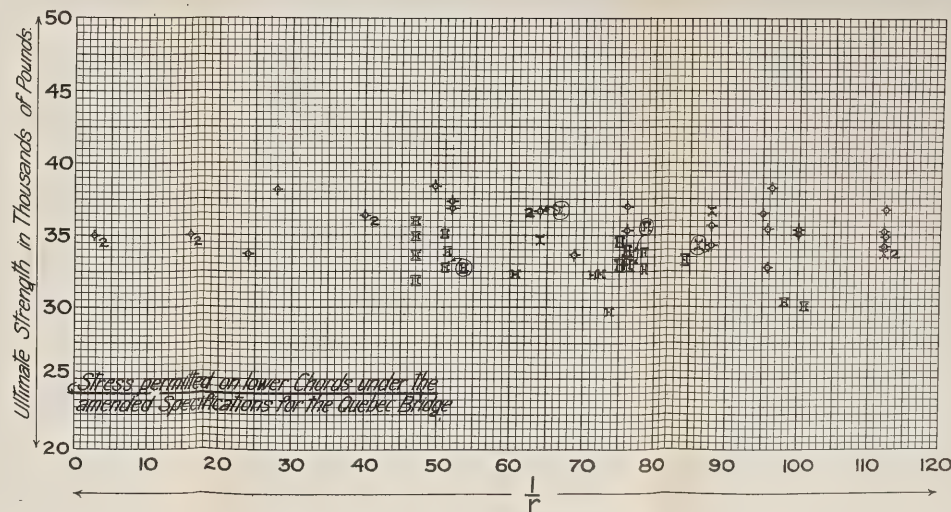
— PIN-ENDED WROUGHT IRON COLUMNS. —

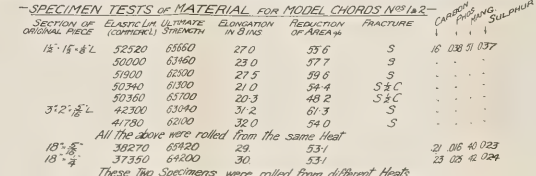


— PIN-ENDED STEEL COLUMNS. —



— FLAT-ENDED WROUGHT IRON COLUMNS. —



FEB. 20TH 1908

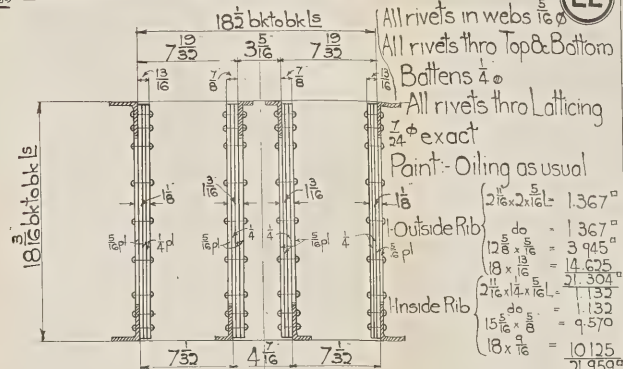
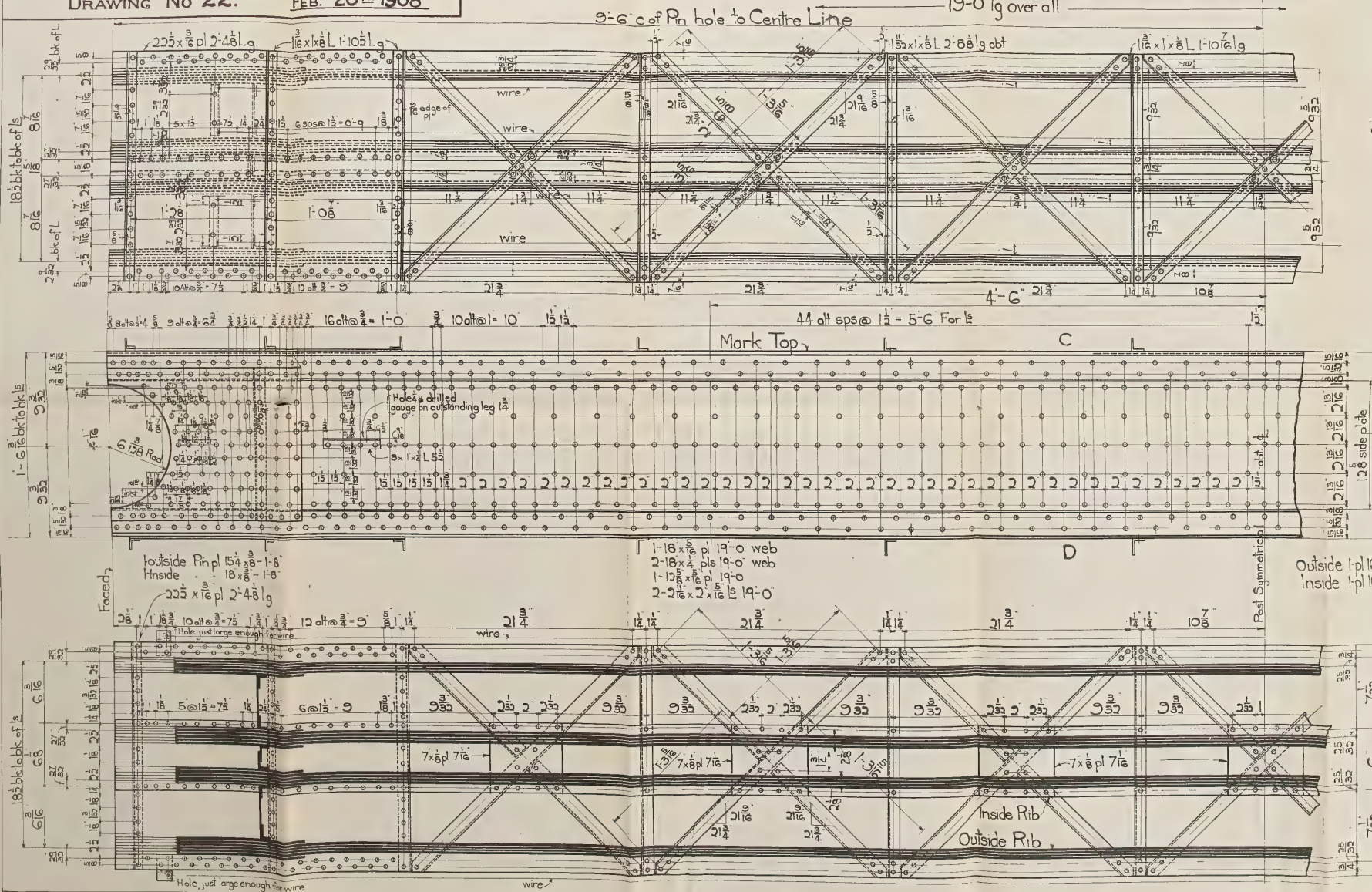
FEB. 20TH 1908

Note:- Material: Med. Steel. Rivets Soft Steel

22

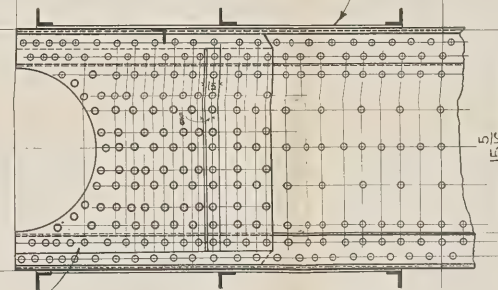
Scale in Feet

19'-0" g over all



Section C.D. Total { 2-Outs Ribs 42' 608"
2-Ins 43' 918"
Tot Section of Post 86' 526"

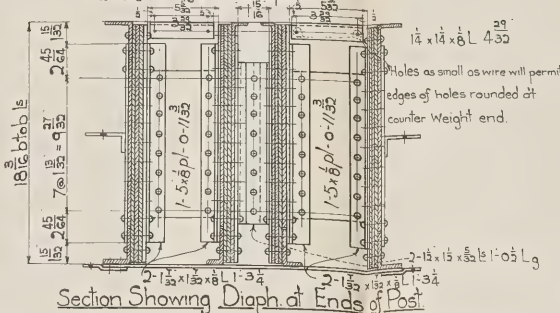
All not shown same as outside rib



Outside 1-pl $16\frac{5}{8} \times 8\frac{13}{16} \times 1'-8"$
Inside 1-pl $16\frac{5}{8} \times 8\frac{13}{16} \times 1'-8"$

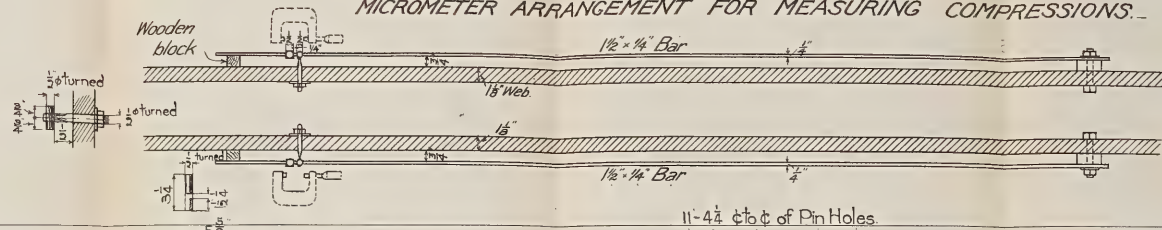
Inside Rib

1-18 x $\frac{5}{16}$ pl 19-0 web plate.
1-18 x $\frac{1}{4}$ pl 19-0 web plate.
2-15 $\frac{5}{16}$ x $\frac{5}{16}$ pls 19-0 side plates
2-2 $\frac{11}{16}$ x $\frac{1}{4}$ x $\frac{5}{16}$ ls 19-0 side plates



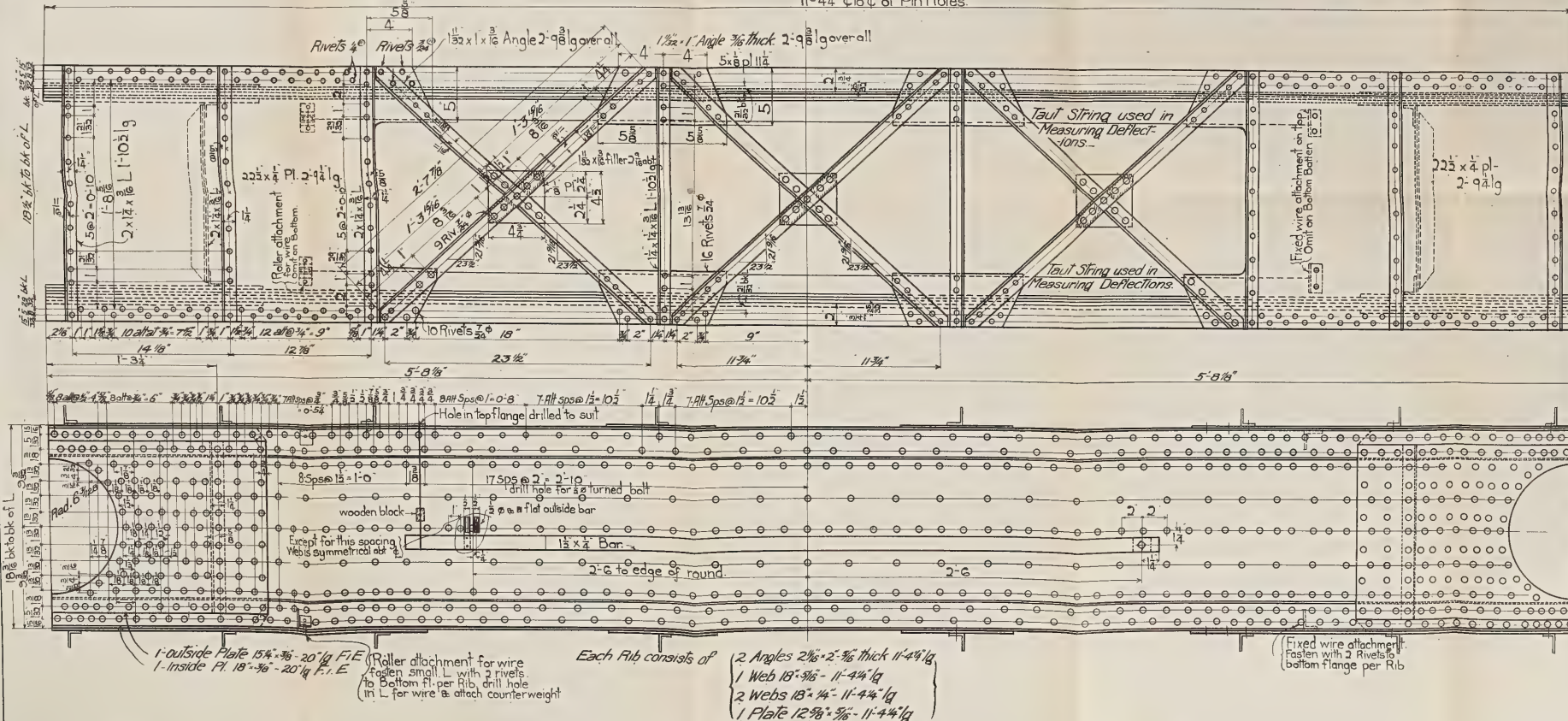
SHOWING ALSO DETAILS
OF MEASURING DEVICES

MICROMETER ARRANGEMENT FOR MEASURING COMPRESSIONS.



Scale in Feet.

$(2\frac{1}{8} \times 2\frac{1}{8} \times L = 1.367''$
do. = 1.367''
1 RIB $(12\frac{5}{8} \times \frac{5}{8} \text{ Web} = 3.945''$
 $18 \times \frac{1}{8} = 14.625''$
per Rib 21.304''
Total Section 42.608''



Wanted: 1-Chord as shown:

Material: Med. Steel.

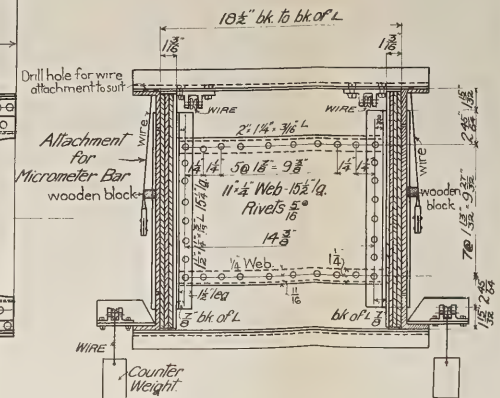
Rivets: Soft Steel.

All Rivets in Webs $\frac{5}{8}$ "

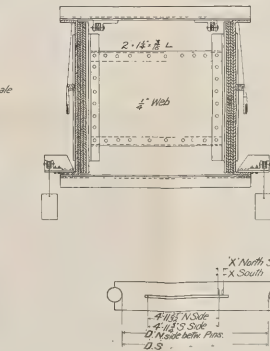
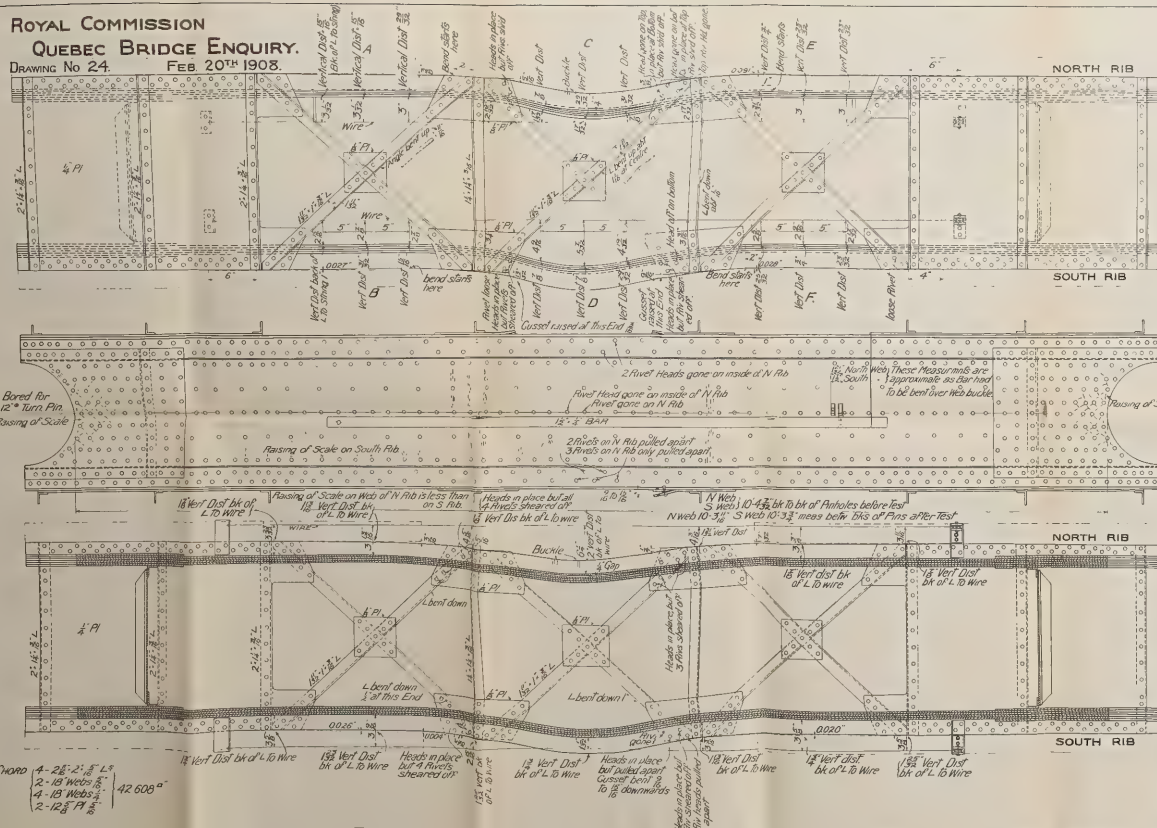
All Rivets in Battens $\frac{1}{2}$ "
except those marked $\frac{3}{4}$ "

All Rivets in Latticing & Gussets $\frac{3}{4}$ "

Paint: Oiling as usual.

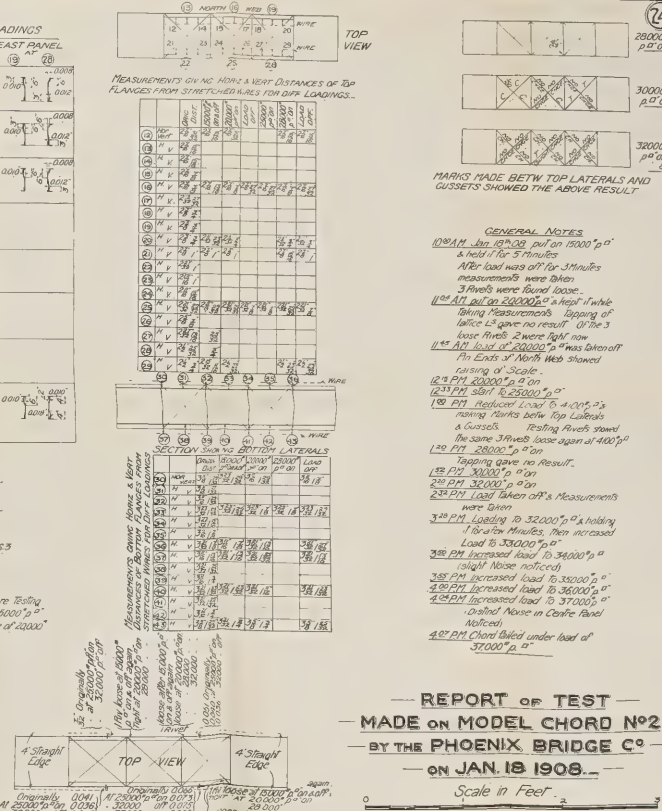


ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.
DRAWING No 24. FEB 20TH 1908.



	Original length	Load 15000 p ^o on	Load 20000 p ^o on	Load 25000 p ^o on	Load 28000 p ^o on	Load 30000 p ^o on	Load 32000 p ^o on	Load 33000 p ^o on	Load 34000 p ^o on	Load 35000 p ^o on	Load 36000 p ^o on	Load 37000 p ^o on	Actual Readings
X North Side	1170	1171	1214	1217	1235	1237	1244	1244	1244	1244	1244	1244	1244
X South Side	1262	1260	1289	1291	1312	1313	1325	1325	1325	1325	1325	1325	1325
D North Side	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88
D South Side	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88	104.88

Figured Compression in S.G. 0.00207 per 1000 p^o (E=29,000,000)



—DRAWING SHOWING DETAILS OF SPECIAL TESTS—
—UPON LATTICE BARS AND RIVETS.—

RESULT:- 2-3rd Single Shear Rivets sheared off at 7500" (tot.)

RESULT: 2- $\frac{1}{2}$ " Single shear Rivets sheared off at 8700" (mt)

NOTE * denotes NO CHANGE

RESULT: 2- $\frac{3}{8}$ " Single-shear Rivets sheared off at 9000* (tot.

NOTE: These Tests were made to observe the Action of Rivets under Compressive Stresses. For Diary see Appendix No 15.

After Failure.

Technical drawing of a compression test specimen, showing front and side views with dimensions and labels.

Front View Dimensions:

- Overall width: 7 1/4"
- End flange width: 2 5/8"
- Distance from end to first hole: 3"
- Distance between first and second hole: 1 3/8"
- Distance between second and third hole: 1 3/8"
- Distance between third and fourth hole: 3"
- Distance from fourth hole to end: 2 5/8"
- Overall height: 4 1/4"
- Distance from top to bottom flange: 13 1/2"

Side View Dimensions:

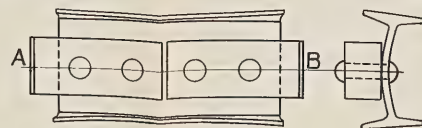
- Overall height: 3"
- Distance from top to first hole: 1 1/2"
- Distance from first hole to bottom flange: 1 1/2"
- Overall width: 7 1/4"

Labels and Notes:

- FACE** (top and bottom edges)
- 3/2" Flat** (top and bottom flanges)
- 7/4" Iq F.E.** (Ends)
- 6" I beam 3/8" Web 13 1/2" Iq.** (Main body)
- Holes for 3/8" Rivets (punched in 3/8" Web)**
- (TESTS)**
- Extreme Ends Faced after being riveted up**

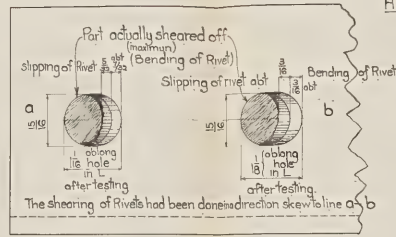
A technical drawing of a rectangular component. The width is labeled as $\frac{3}{16}$ " and the height as $\frac{11}{16}$ ". The component features four U-shaped slots, each with a dashed line indicating its internal profile. The slots are evenly spaced along the length of the rectangle.

(TESTS MADE AT WM. SELLERS & CO
PHILA. PA. JAN. 21. 08.)



- FULL SIZE SECTION ON LINE A-B TAKEN FROM ACTUAL TEST. -

- TEST PIECES HAD BEEN SAWED INTO HALVES —
- *Cut shows that Rivets & Main Section were like one solid Piece* —
- *Rivets slipped from $\frac{5}{32}$ " to $\frac{3}{16}$ " —*



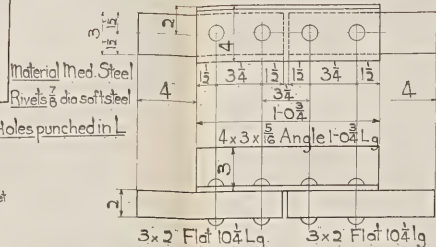
Section along back of L looking towards L.
Maximum $\frac{3}{8}$ flat of heads recorded

Remarks
One Test broke at 62,500
Other " " 63,100
or 2 $\frac{3}{8}$ Shear Rivets
(62,500*)
Broke at 63,100*
or 1 $\frac{3}{8}$ Single shear Rivet
fails at 31,400*

Shape of Single Shear Rivet
just before failing

Test was made Jan. 14th 1908 at Phoenixville

4x3x $\frac{5}{16}$ L Angle Sketch of above Tension Test



Before Testing

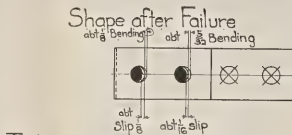
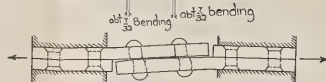
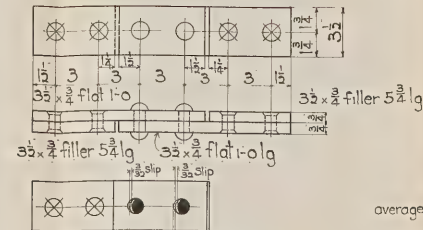
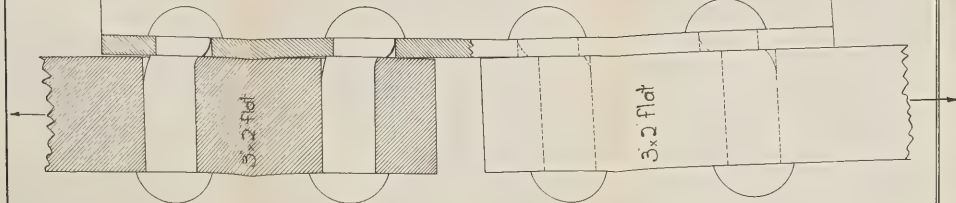
Test No 1	3	3	3
Test No 2	3	3	3

after testing

Test No 1	3	3	3
Test No 2	3	3	3

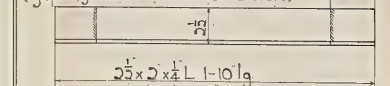
Bend after testing

These two Rivets were sheared off

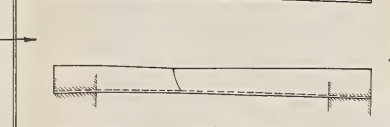
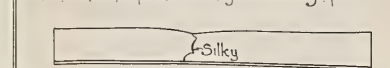


Tests on rivets in Single Shear
test made at Phoenixville Pa.

grip on 2 1/2 leg was first only 1 1/2 long but broke off
(grip length had been increased then)



2 1/2 x 2 1/2 Angle broke at 62,000*
or at 58,300* per in (2 1/2 leg used for grip)



Test was made Jan. 9th 1908

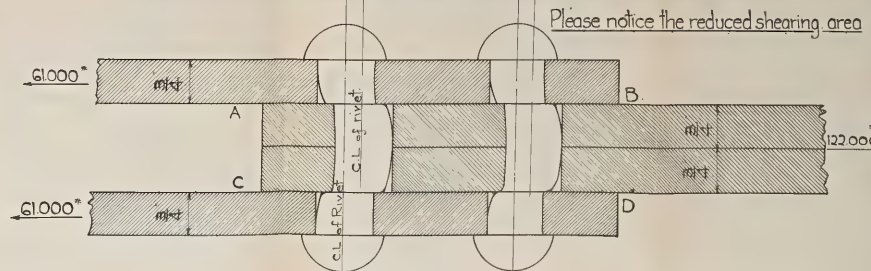
average obt 33

Shape of Single Shear
just before failing

Section at A-B
Test No 1: 2 Single Shear Rivets
failed in shear at 63,000
Test No 2: Test had been carried to
63,000 and stopped before rivets
failed rivets showed movement
Test No 3: 2 Single shear Rivets
failed in shear at 63,800*
Test No 4: 2 single shear
7/8" rivets failed in shear
at 64,700

Tests on Rivets in double shear

Shape of 7/8" Rivets during testing and just before Rivets got sheared off



TEST MADE TO OBSERVE ACTION
OF RIVETS & LATTICE ANGLES.

Test made Nov. 26th 1907
At Phoenixville Pa.

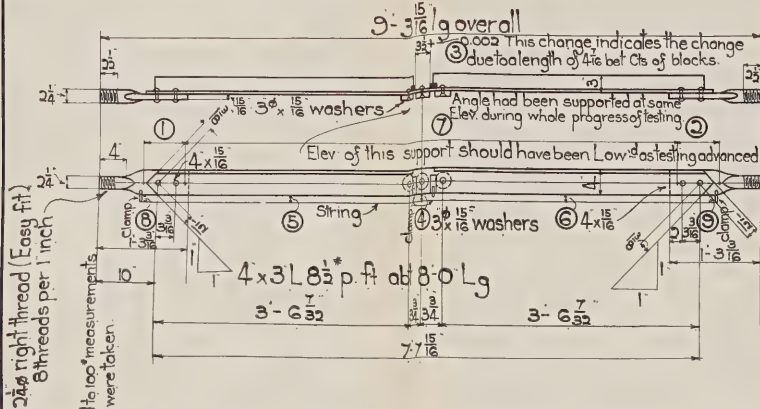
ROYAL COMMISSION

QUEBEC BRIDGE ENQUIRY.

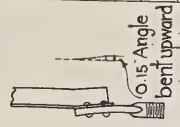
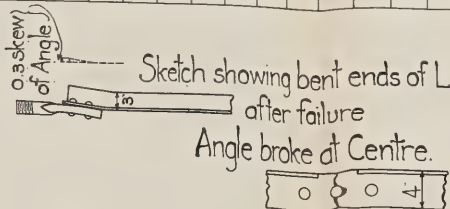
DRAWING No 27.

FEB. 20th 1908.

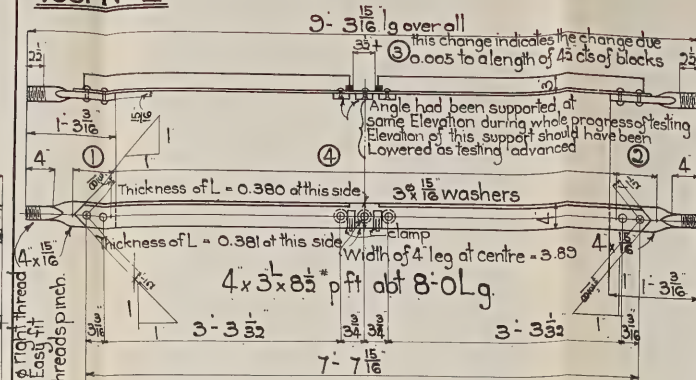
Test No 1



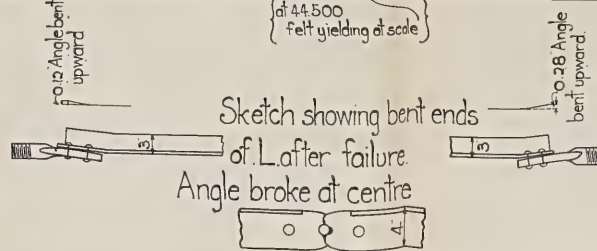
Original Lgh. 310 PM	Load of 5000 lbs on 100" measurements	10,000" on	15,000" on	20,000" on	25,000" on	27,500" on	30,000" on	32,500" on	35,000" on	37,500" on	40,000" on	42,500" on	45,000" on	47,500" on	50,000" on	52,500" on	55,000" on	57,500" on	60,000" on
1) 6.75 6.76	Chg	Na	Na	Chg	Chg	Na	Chg	6.77 6.77	6.78 6.78	6.78 6.78	6.78 6.79	6.79 6.79	6.81 6.82	6.85 6.86	6.92 6.92	6.97 6.97	6.99 6.99	6.99 6.99	6.99 6.99
2) 6.75 6.76	Chg	Na	Na	Chg	Chg	6.77	6.78 6.79	6.79 6.79	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80	6.80 6.80
3) 0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
4) 0.75	0.75	0.76	0.74	0.73	0.73	0.76	0.76	0.73	0.74	0.77	0.78	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
5)																			
6)																			
7) 6-11 1/8																			
8) 6-11 1/8																			
9) 6-11 1/8																			



Test No 2



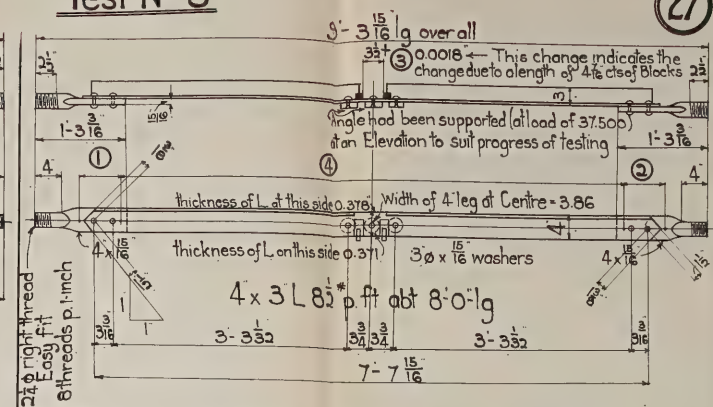
original Lgh. 310 PM	Load of 5000 lbs off again	10,000 on	15,000 on	20,000 on	25,000 on	30,000 on	35,000 on	37,500 on	40,000 on	42,500 on	45,000 on	47,500 on	50,000 on	52,500 on	55,000 on	57,500 on	Failed at 59,800 on 4:30 PM.		
(1) 6.75 6.75	No Chg	No Chg	No Chg	No Chg	No Chg	6.76	6.76	6.76	6.77	6.77	6.79	6.81	6.83	6.86	6.87	6.91	6.97	6.96	
(2) 6.75 6.75	No Chg	No Chg	No Chg	No Chg	No Chg	6.78	6.80	6.82	6.84	6.83	6.85	6.87	6.91	6.97	6.96	6.96	6.96	6.96	
(3) 0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000	
(4) 6-11 1/8																			6-11 1/8 before break 7-08 break



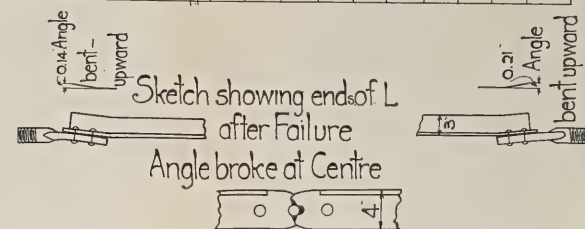
Note: Material Med Steel
Rivets Soft steel (Coopers 01 Spec.)
All holes punched for 7/8 Rivets

Note: This size of angle was used for lacing the tower chords

Test No 3



Original Lgh. 310 PM	Load of 5000 lbs on 100" measurements	10,000" on	15,000" on	20,000" on	25,000" on	30,000" on	35,000" on	37,500" on	40,000" on	42,500" on	45,000" on	47,500" on	50,000" on	52,500" on	55,000" on	57,500" on	60,000" on
1) 6.74 6.74	Chg	6.76 6.76	6.76 6.76	6.77 6.77	6.78 6.78	6.81 6.81	6.82 6.82	6.83 6.83	6.86 6.86	6.89 6.89	6.94 6.94	6.94 6.94	6.94 6.94	6.94 6.94	6.94 6.94	6.94 6.94	6.94 6.94
2) 6.74 6.74	Chg	6.76 6.76	6.76 6.76	6.78 6.78	6.79 6.79	6.80 6.80	6.83 6.83	6.85 6.85	6.88 6.88	6.90 6.90	6.92 6.92	6.92 6.92	6.92 6.92	6.92 6.92	6.92 6.92	6.92 6.92	6.92 6.92
3) 0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000
4) 6-11 1/8		6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8	6-11 1/8



— RESULTS OF TESTS OF 3" x 4" x 3/8" Ls —
— MADE FOR THE COMMISSION —
— AT WM SELLERS & CO PHILA. —

Scale in Feet
0 1 2 3 4 5 6

ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

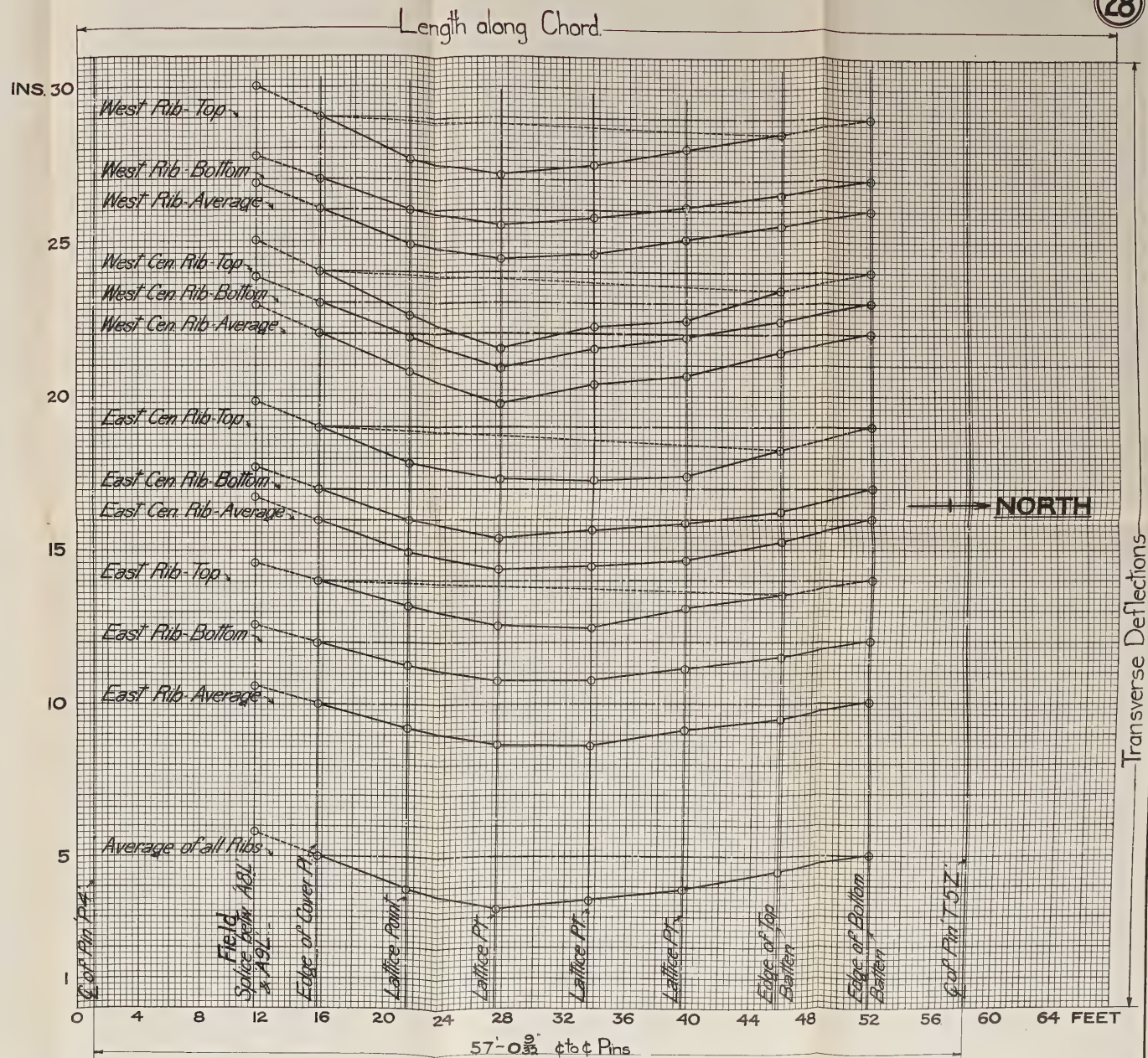
DRAWING N^o 28.

FEB. 20TH 1908.

— **DIAGRAM SHOWING DEFLECTIONS** —
— **IN RIBS OF ANCHOR ARM** —
— **LOWER CHORD A9L** —

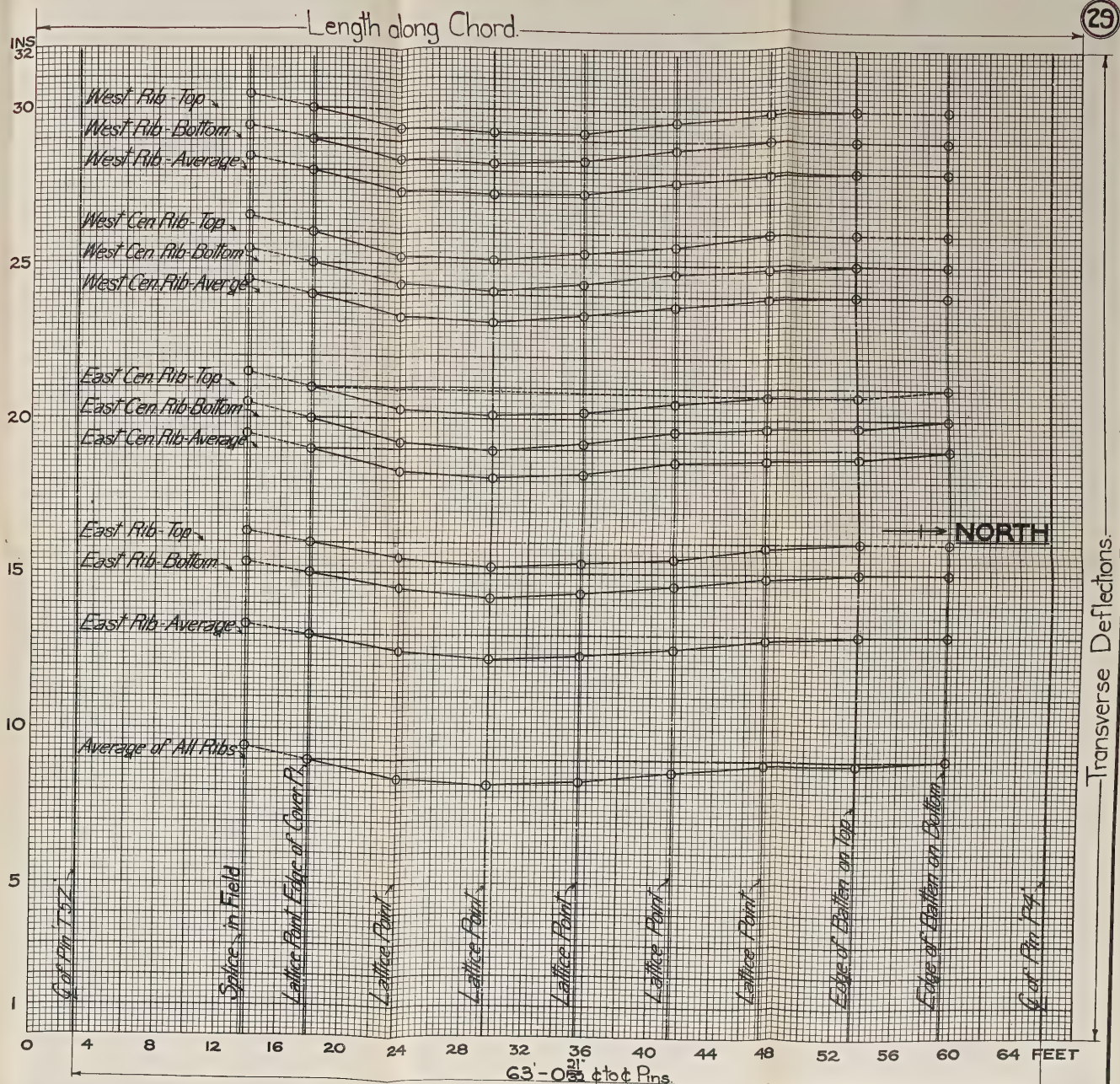
Scales { Longitudinal 1" = 4 Ft
Transverse 1" = 2 "

(As measured on August 27th 1907)



FEB. 20TH 1908.

(As measured on August 27th 1907)



ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

DRAWING N^o 30.

FEB. 20TH 1908.

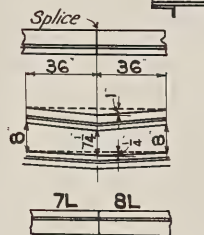
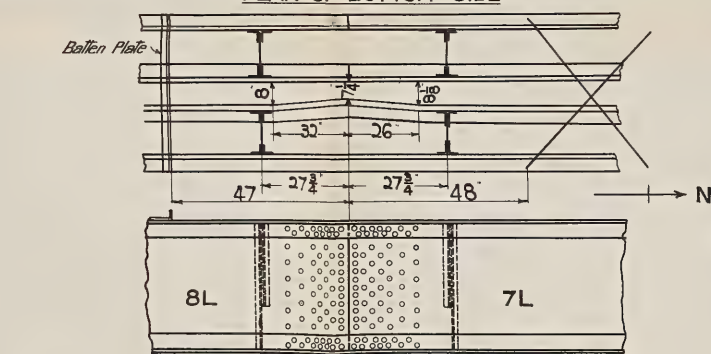
— **DIAGRAM SHOWING DEFLECTIONS** —
— **IN RIBS OF CANTILEVER ARM** —
— **LOWER CHORD 8R.** —

Scales { Longitudinal 1" = 4' :
Transverse 1" = 2' :

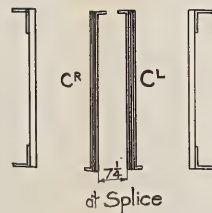
(As measured on August 27th 1907)

— **PLAN SHOWING DEFLECTIONS AT THE** —
— **FIELD SPLICE BETWEEN CHORDS** —
— **7L AND 8L CANTILEVER ARM AS** —
— **MEASURED ON AUG 6TH & AUG 16TH 1907** —

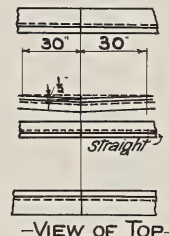
— **PLAN OF BOTTOM SIDE** —



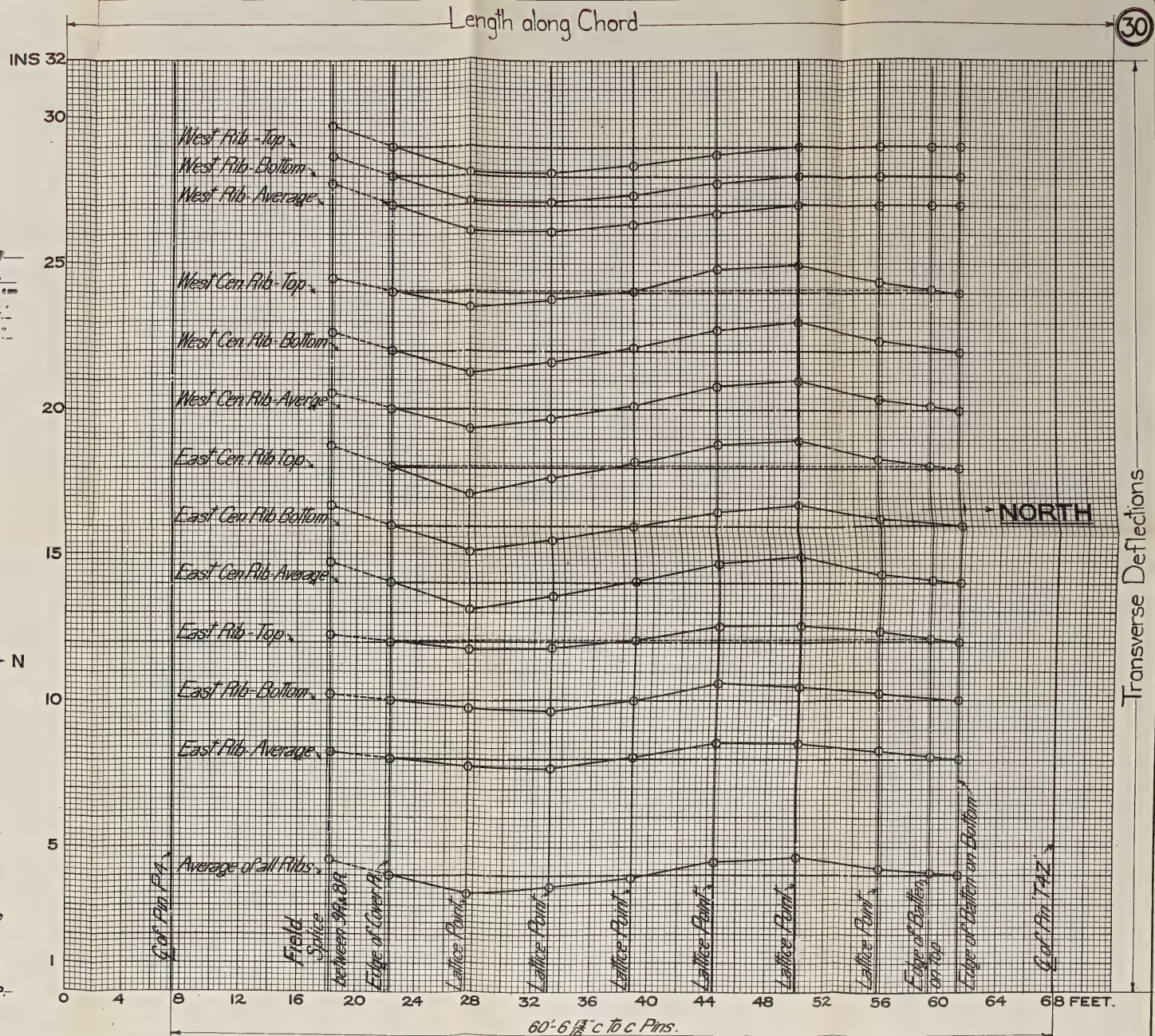
VIEW OF BOTTOM.



at Splice



— **VIEW OF TOP.** —



ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY

DRAWING No 31.

FEB. 20TH 1908.

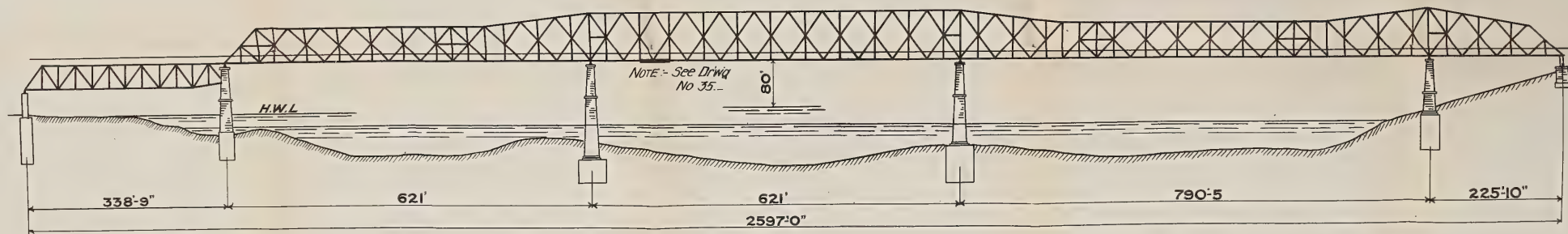
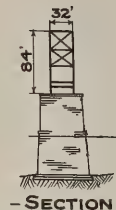
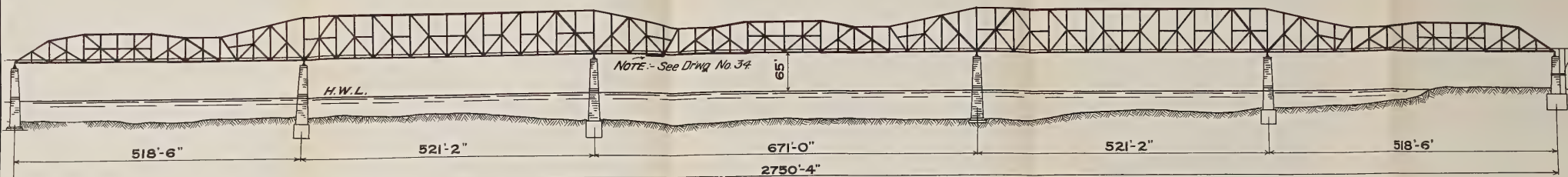
Scale in Feet.



ELEVATIONS OF
GREAT CANTILEVER BRIDGES.

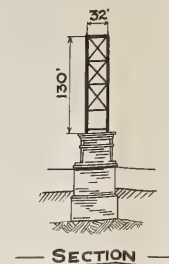
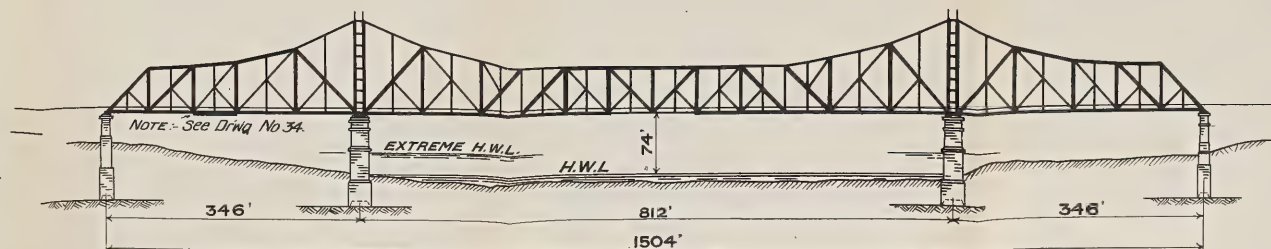
31

THE THEBES BRIDGE



THE MEMPHIS BRIDGE

THE
MONONGAHELA
BRIDGE

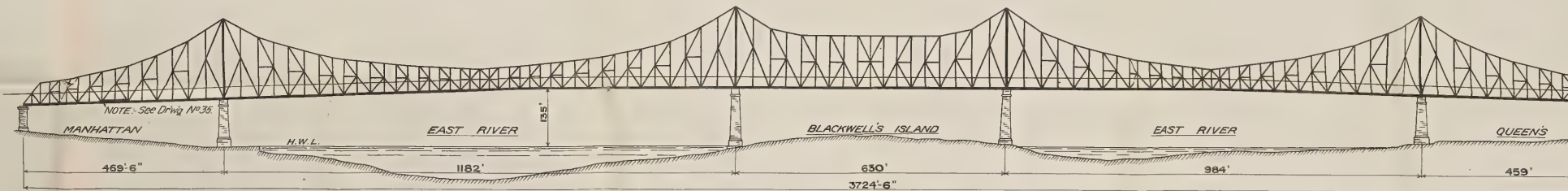
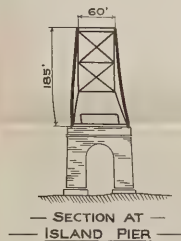
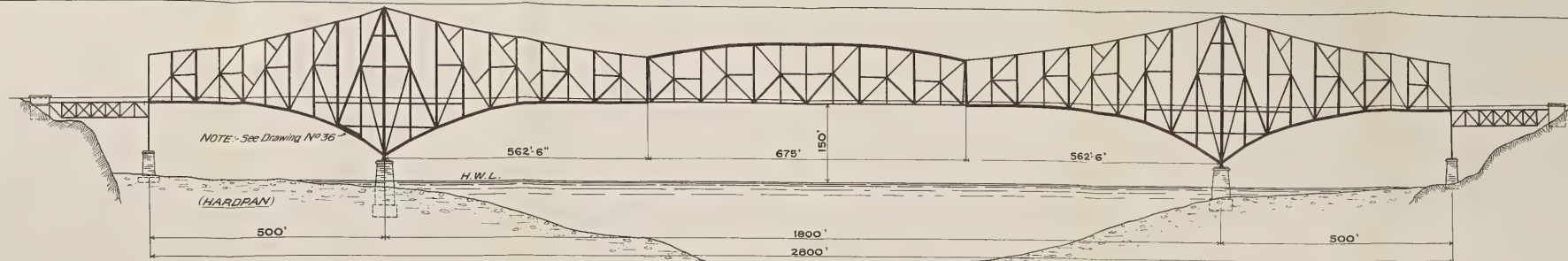
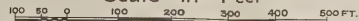


ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY

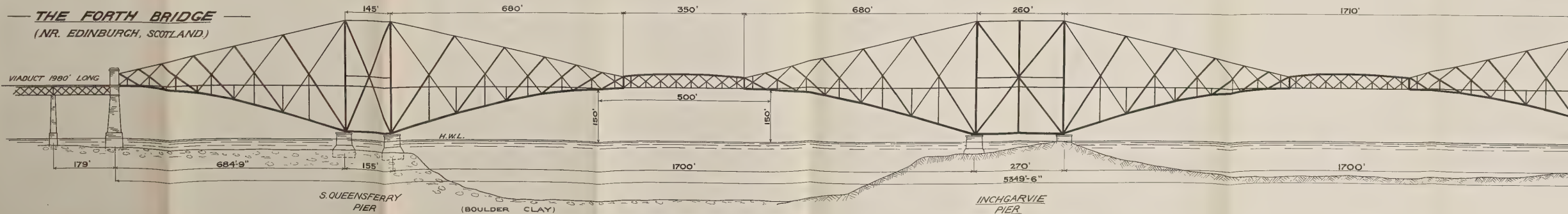
DRAWING N^o 32.

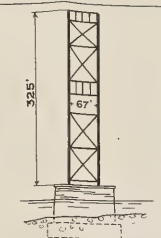
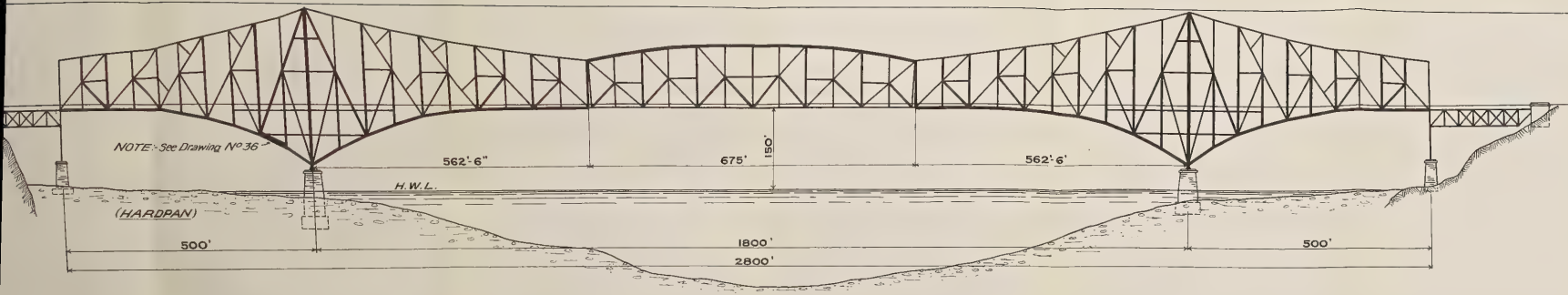
FEB. 20TH 1908

Scale in Feet



THE FORTH BRIDGE (NR. EDINBURGH, SCOTLAND.)

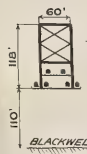
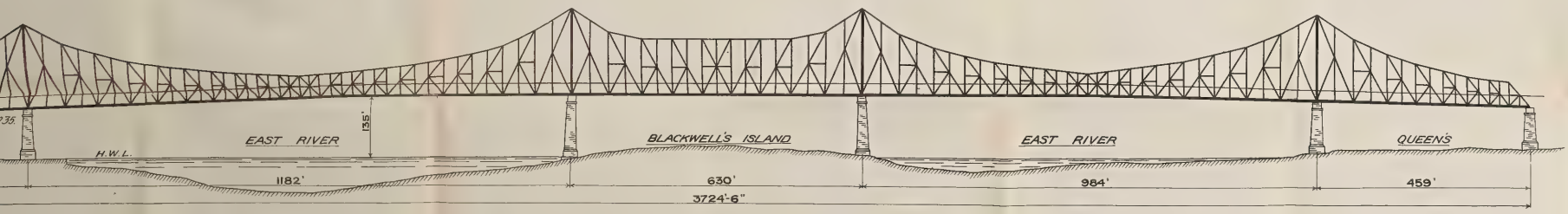




SECTION AT NORTH MAIN PIER

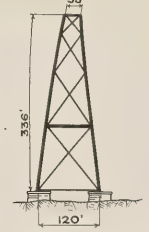
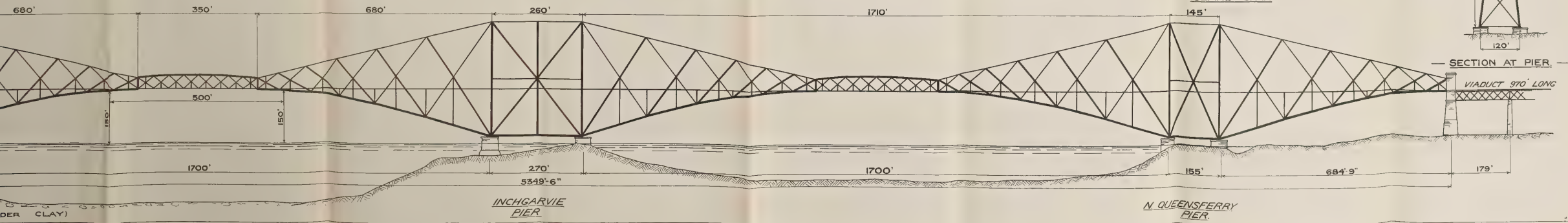
THE QUEBEC BRIDGE
(QUEBEC : QUE.)

ELEVATIONS OF
GREAT CANTILEVER BRIDGES.

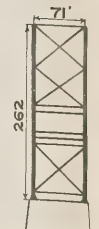
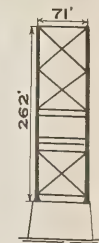
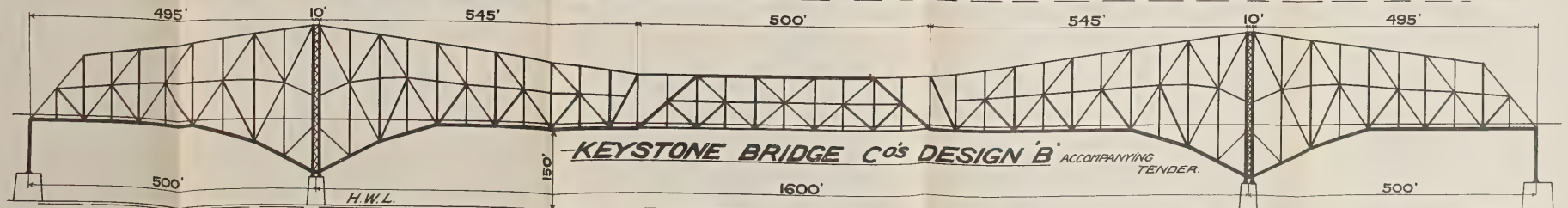
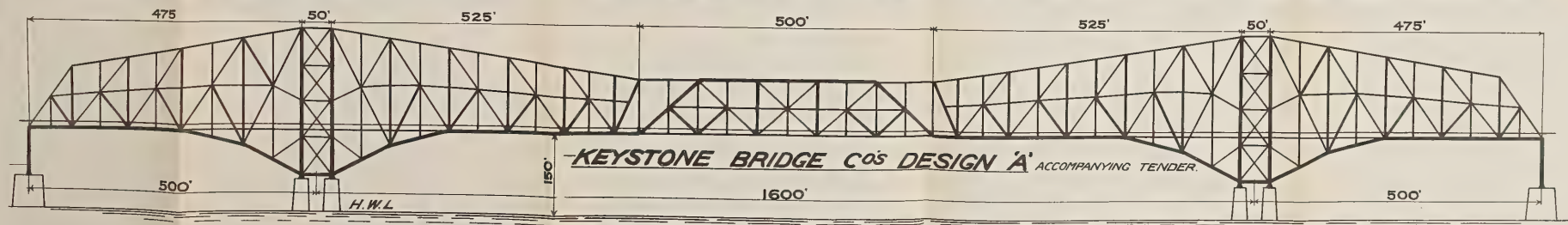
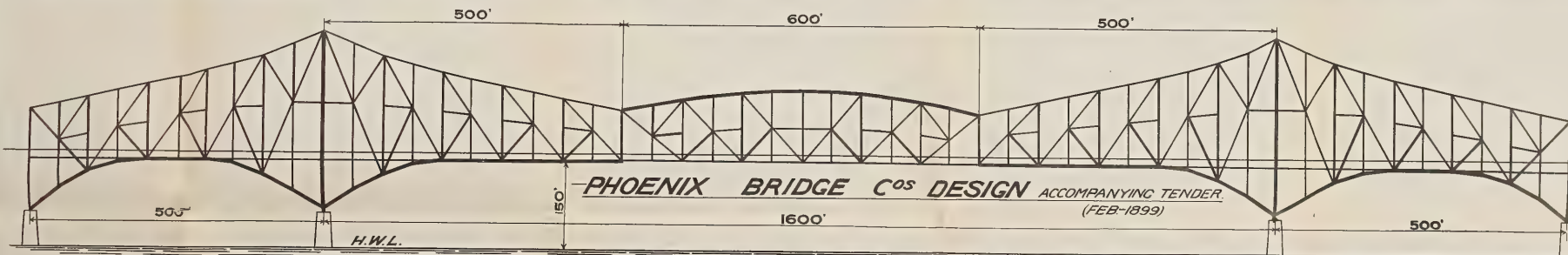
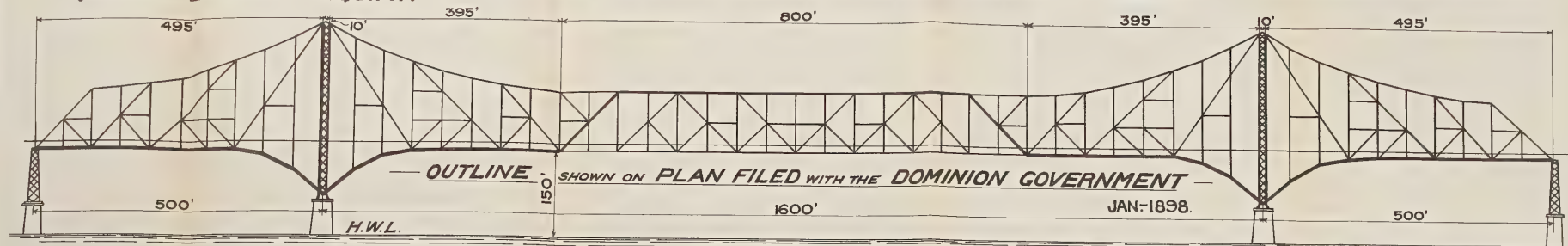


MID-SECTION - ISLAND SPAN

BLACKWELL'S ISLAND BRIDGE
(NEW YORK : N.Y.)



SECTION AT PIER

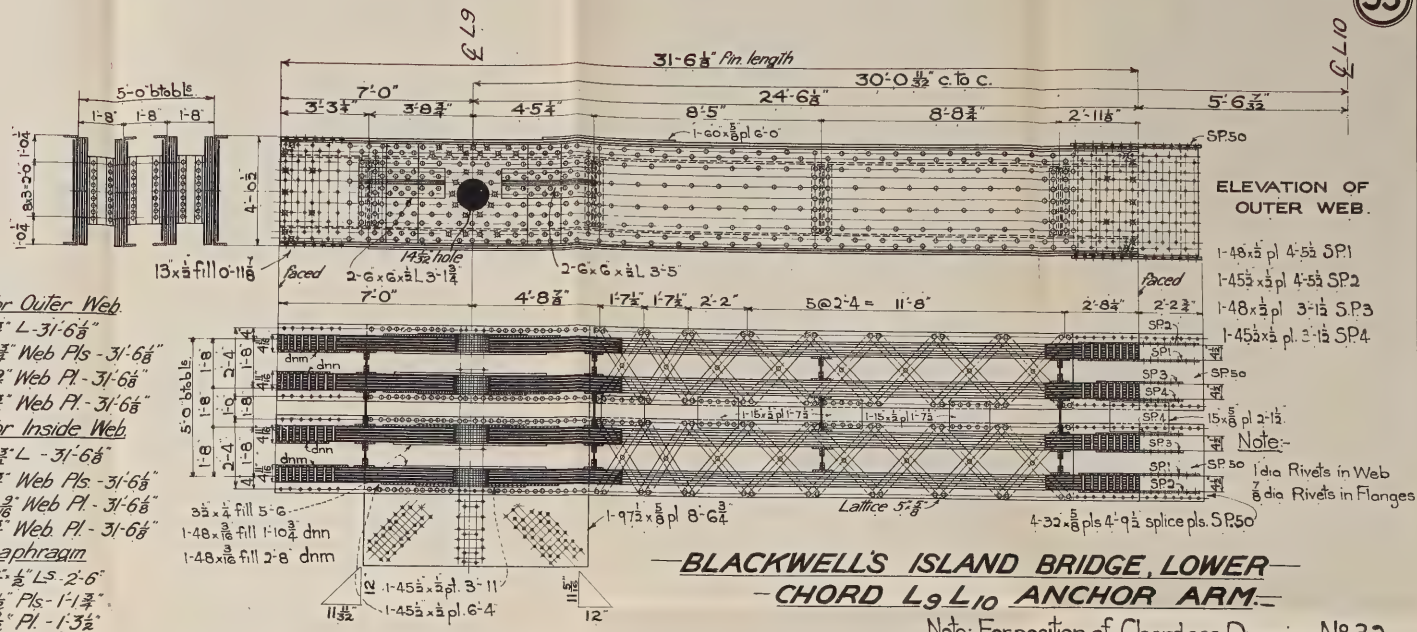
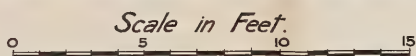


ROYAL COMMISSION
QUEBEC BRIDGE ENQUIRY.

DRAWING N^o 35.

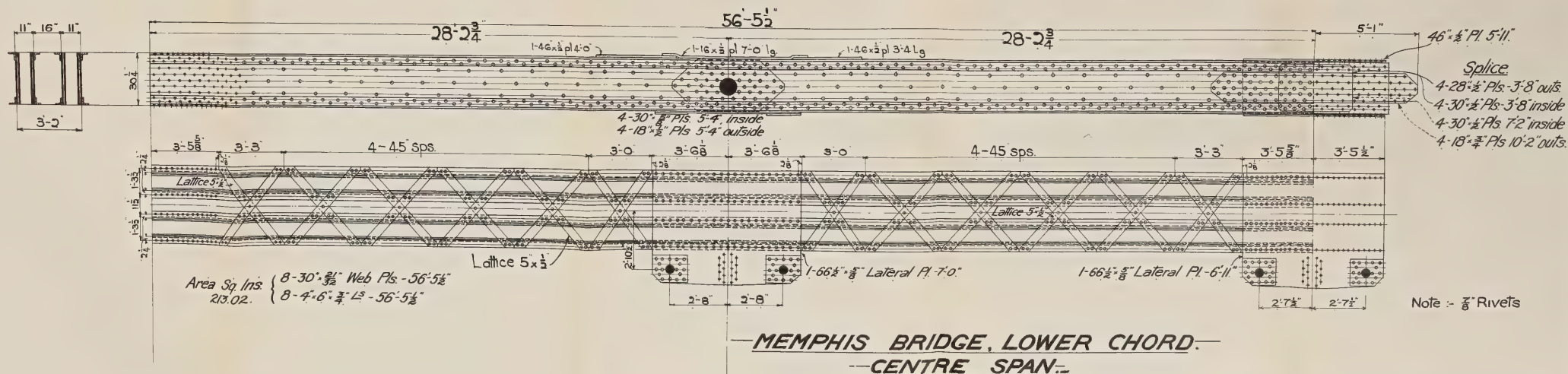
FEB. 20TH 1908.

—DRAWING SHOWING DESIGN— —OF COMPRESSION CHORDS— —FOR BRIDGES MENTIONED—



BLACKWELL'S ISLAND BRIDGE, LOWER
-CHORD L₉L₁₀ ANCHOR ARM-

Note:- For position of Chord see Drawing N^o 32

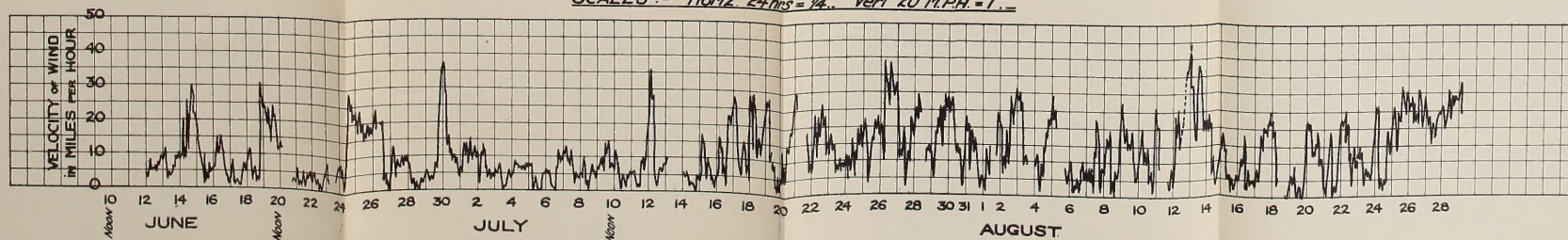
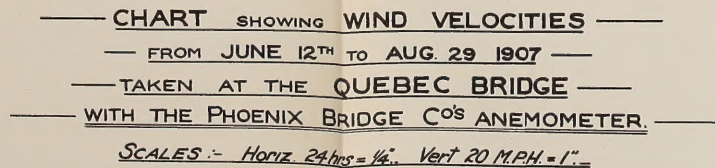
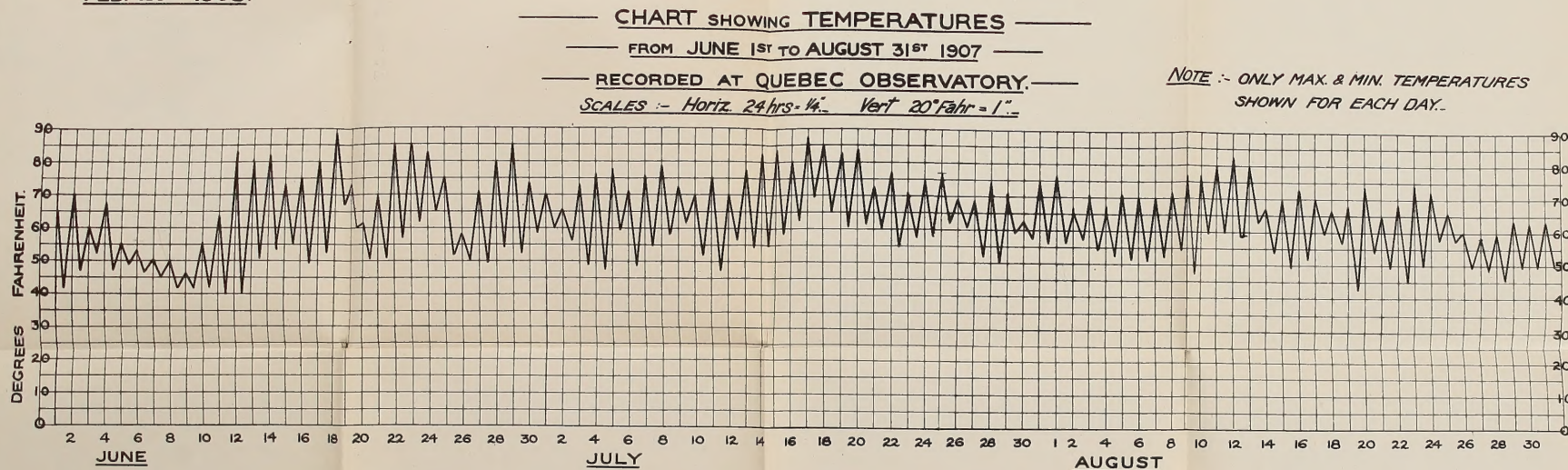


Note:- For position of Chord See Drg. No 31

ROYAL COMMISSION QUEBEC BRIDGE ENQUIRY

DRAWING N^o 37.

FEB. 20TH 1908.



-RECORD OF- MAXIMUM WIND VELOCITIES 1890-1907 TAKEN AT QUEBEC OBSERVATORY.			
DATE	DIRECTION	MAX. VEL.	DURATION
Jan 13, 1890	S.W.	60 Miles	20 Hours
May 4, 1893	N.	67 "	44 "
Jan 30, 1894	N.E.	66 "	25 "
Feb 8, 1895	E.	79 "	24 "
April 14, 1895	N.E.	64 "	72 "
Feb 6, 1896	N.E.	66 "	77 "
Mar. 25, 1897	N.E.	61 "	38 "
Feb 20, 1898	N.E.	66 "	93 "
Dec 4, 1898	N.E.	62 "	25 "
Feb 22, 1900	N.E.	62 "	38 "
Mar. 1, 1900	N.E.	70 "	36 "
Mar. 16, 1900	N.E.	68 "	11 "
Feb 1, 1902	N.E.	77 "	47 "
Feb 6, 1904	N.E.	60 "	34 "
Jan 6, 1905	N.E.	65 "	28 "
Nov 6, 1907	N.E.	69 "	35 "

